

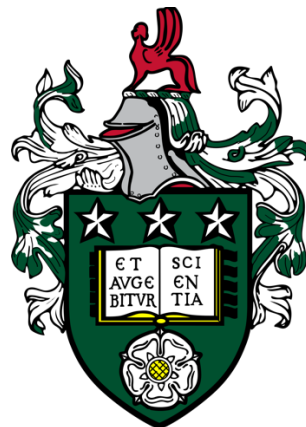
**The effect of intra-workplace pay inequality on employee trust in managers
and workplace performance:
The interplay of fairness perceptions, shared values, and collective
employee voice**

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Submitted in accordance with the requirements for the degree of Doctor of Philosophy

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The candidate confirms that the work submitted is his own, except where work which has formed part of jointly authored publications has been included. The contribution of the candidate and the other authors to this work has been explicitly indicated below. The candidate confirms that appropriate credit has been given within the thesis where reference has been made to the work of others.

Findings from Chapter 3, 4 and 5 have been turned into one jointly written peer-reviewed article:

Schulz F, Valizade D and Charlwood A (2021) The effect of intra-workplace pay inequality on employee trust in managers: Assessing a multilevel moderated mediation effect model. *Human Relations* 00(0): 1-29 (published onlineFirst 21st February 2021)

The journal article differs from the PhD in several ways. First, the journal article did not include the second proposed mediator, shared organisational values. Second, in the article we did not test for the *non-linear* relationship between intra-workplace pay inequality and perceived manager fairness, but only for a mediating role of fairness perceptions for the intra-workplace pay inequality – employee trust in manager relationship. Third, regression coefficients in the article were based on non-weighted samples. In the PhD, I used non-weighted and weighted samples, as well as a subsample of medium and large workplaces.

The majority of the work was done by me. Danat Valizade re-estimated the random forest models. He added individual conditional expectation (ICE) plots, which I did not use in the PhD thesis. Moreover, Dr. Valizade proof-read and re-wrote small parts when necessary to improve the flow and structure of the overall argument. Andy Charlwood proof-read, re-wrote small parts where necessary to improve the flow and structure of the overall argument, and regularly gave suggestions and comments. Both helped to craft response letters and to answer reviewer comments in a suitable manner.

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Abstract

Many industrialised and emerging economies have come to acknowledge the significant increase in income inequality over the past decades as problematic. Macro level research has consistently found a negative relationship between income inequality and trust in others. This PhD research project was motivated to find out if similar relationships also play out on the organisational level and, if so, what factors are responsible for them. To investigate this, I study the relationship between pay inequality and employee trust in managers at the workplace level using the 2011 Workplace Employment Relations Study – a large scale employer-employee matched survey representative of workplaces in Britain. Using machine learning algorithms, the findings suggest that, contrary to the macro level, the relationship between intra-workplace pay inequality and employee trust in managers is non-linear, following an inversely U-shaped pattern. That is, the relationship is positive for small and moderate levels of pay inequality. However, once pay inequality passes a threshold, identified at a Gini coefficient around 0.25, any increase in pay inequality is associated with lower levels of employee trust in managers. The relationship is mediated by employees' perception of manager fairness and shared values. The association between intra-workplace pay inequality and perceived manager fairness, in line with findings for the direct relationship, is inversely U-shaped with an inflection point at a Gini coefficient of around 0.25. Shared values mediate the relationship between perceived manager fairness and employee trust in managers. The relationship is predominantly found in workplaces with collective bargaining coverage, and trade union presence, as opposed to those workplaces without either proxy of employee voice, which are characterised by a negative association between pay inequality and trust, as well as between pay inequality and perceived manager fairness. A comparison between results for the weighted, unweighted and a sub-sample of medium and large workplaces indicate that these relationships apply mostly to medium and large workplaces. Based on these findings it was hypothesised that the much-debated relationship between pay inequality and firm/workplace performance is also likely to be inversely U-shaped. Findings offer support for this hypothesis, though results are sensitive to the type of workplace performance measure, sample and statistical approach employed. The findings have important implications for theory, methodology and practice.

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Chapter 1: Introduction

Trust is the foundation of a well-functioning society. The role of trust in our everyday life spans from the private – family, friends, partners – over the economic – work, business, economic exchanges, investment – to the public – government, media, institutions. Any type of relationship is built on and necessitates trust. Considering this, imagine, just for a moment, a society without trust.

How would you be able to buy a product if you can neither trust the information on the label nor the company who produced it? How would you be able to drink water from the tap without trusting the institutions that guarantee its safety? How would you be able to pay with your money if you don't trust the central bank to vouch that this piece of paper has the value that is printed on it? How would you be able to step on a bus if you don't have a basic level of trust that the driver has the intention, ability and authority to safely drive this bus? How would you be able to inform yourself about the world if you can neither trust the media nor scientists? These simple questions highlight the centrality of trust for life in our current society.

Empirical studies have repeatedly supported the positive influence of trust. Trust reduces transaction costs (Knack and Keefer, 1997). By not having to check or proof every interaction or exchange in our lives, as described above, trusting saves valuable time, money and brain capacity, which can be employed to better uses. This implies that by trusting others we have a more positive outlook and are more optimistic about the world (Uslaner, 2000), which leads to more cooperation (Putnam, 2000; Rothstein and Uslaner, 2005) and voluntary engagement in our community (Uslaner and Brown, 2005). Having a more positive outlook on the world and generally being a more trusting person increases individual well-being by ameliorating the negative psychological consequences of ill-health, unemployment or discrimination (Helliwell et al., 2016), whilst simultaneously increasing life expectancy and lowering mortality rates on a societal level (Elgar, 2010; Kawachi et al., 1997). Trusting societies are also characterised by less unethical behaviour. In high-trust societies, there are lower levels of crime and corruption (Bjørnskov, 2011; Knack and Zak, 2003; Rothstein and Uslaner, 2005), lower homicide rates (Elgar and Aitken, 2010) and less tax evasion (Hammar et al., 2009; Uslaner, 2007). If I do not trust others to pay their taxes or the government to make good use of it, why should I pay them? On a political level, trust has been linked to greater political participation (Uslaner and Brown, 2005). Considering the many societal challenges ahead, it is important to notice that trust in government and government institutions has a positive influence on support for government

spending (Rudolph and Evans, 2005); environmental policy (Fairbrother, 2016; Hammar and Jagers, 2006) and economic redistribution (Hammar et al., 2009). Ultimately, encompassing many of these elements, trust has been repeatedly associated with economic development (Beugelsdijk et al., 2004; Bjørnskov, 2012, 2017; Dearmon and Grier, 2009; Horváth, 2012; Knack and Keefer, 1997; Knack and Zak, 2003). In sum, for society as well as for the individual located within a society, trust can be described as the glue that keeps us together.

Despite these overwhelmingly positive outcomes, trust has been declining in many Western nations (Edelman, 2020; Ortiz-Ospina, 2016; Uslaner, 2000). Simultaneously, income inequality has increased considerably (Atkinson, 2015; OECD, 2021; Piketty, 2014). Based on these trends, scholars have investigated and found a negative relationship between income inequality and social trust, that is trust in others in society one does not have a personal relationship with. Next to cross-sectional empirical evidence (see for instance (Delhey and Newton, 2003, 2005; Elgar, 2010; Elgar and Aitken, 2010; Fairbrother and Martin, 2013; Kawachi et al., 1997; Knack and Keefer, 1997; Leigh, 2006a; Uslaner and Brown, 2005; Wilkinson and Pickett, 2011; Zak and Knack, 1998), studies using longitudinal (Hastings, 2018; Oishi et al., 2011) or panel data (Barone and Mocetti, 2016; Fairbrother, 2014; Graafland and Lous, 2019; Gustavsson and Jordahl, 2007; Larsen, 2013) all found a negative relationship between income inequality and trust in others. That is, not only are countries with higher income inequality characterised by lower levels of trust, but increases in pay inequality over time have been associated with decreasing levels of trust, whether it is for a single country like the USA (Gustavsson and Jordahl, 2007; Hastings, 2018; Oishi et al., 2011), for a few case studies (Larsen, 2013) or for a large group of countries (Barone and Mocetti, 2016; Fairbrother, 2014; Graafland and Lous, 2019). This temporal dimension is important because it allows, under certain conditions, to draw causal inferences about the relationship between income inequality and trust (Cunningham, 2021). Although the problem of reversed causality is still present in longitudinal studies, if accompanied by techniques such as instrumental variables, as for instance Gustavsson and Jordahl (2007) employed in their article on the relationship in Sweden, conclusions about the causal effect of income inequality on trust are more robust (Cunningham, 2021). These consistent findings on the relationship between income inequality and trust on the macro level open broader questions.

First, by focussing exclusively on income inequality on trust on the macro level, previous scholarly work has hitherto overlooked to investigate whether the relationship is also present on other levels of analysis, such as the firm or workplace level. Second, how can we both

theoretically and empirically explain the found negative relationship? Third, previous research has portrayed this income inequality – trust relationship as universal. Yet, do certain institutional arrangements influence how the relationship turns out? Fourth, what are the wider implications of this relationship for other areas of research?

It is these questions this PhD is concerned about, and which will be briefly introduced in the following sub-sections of this introductory chapter, before I will discuss them in detail in their respective empirical chapters (chapters 3, 4, 5 and 6).

1.1 The organisation/workplace as unexplored level of analysis

The aforementioned evidence focuses exclusively on income inequality and trust on the macro level. Organisational research has studied the relationship between pay inequality levels and employee attitudinal outcomes such as satisfaction and commitment (Breza et al., 2018; Card et al., 2012; Green and Zhou, 2019; Song and Whang, 2020) as well as employee productivity (Kepes et al., 2009). Whilst the direction of the effect varied, all these studies suggest that intra-organisational pay inequality influences employees' attitudes. The question when pay inequality is perceived as positive and when as negative was central to the strand of research. Other scholars have discovered a consistent relationship between organizational justice perceptions and employee trust in superiors and the general management (see for instance Ayree et al., 2002; Colquitt et al., 2001; Dirks and Ferrin, 2001). In regard to pay, Tjosvold (1982, 1985), and Ferrin and Dirks (2003) found experimental evidence for the role of reward structures for interpersonal trust. This implies that how resources in the firm are being distributed and how pay is being allocated is important for trust.

These three streams of literature suggest that a) actual levels of pay inequality affect employee attitudes, b) an employee's individual perception to different resource allocations is important for trust, and c) different systems or structures of pay affect the trust employees have in their managers. The findings hint at a possible relationship between pay inequality and trust at the workplace and at some potential underpinning and confounding factors. Yet, to the best of my knowledge, the link between actual levels of intra-workplace pay inequality and employee trust in managers has not been investigated to this day.

This is an important knowledge gap considering the importance of employee trust in managers for employee and workplace outcomes on the one hand (Colquitt et al., 2007; Dirks and Ferrin, 2002; Innocenti et al., 2011; Timming, 2012; Top et al., 2015) and the role of intra-firm pay inequality for overall inequality increases on the other hand (Barth et al., 2014; Card et al., 2013; Song et al., 2019).

The first research questions this PhD seeks to answer is thus:

1. What is the role of intra-workplace pay inequality in employee trust in managers? Does the established negative relationship for the macro-level also hold at the workplace level for interpersonal forms of trust?

1.2 Lack of robust evidence for theoretical explanations

Although various theoretical explanations for the negative relationship between income inequality and social trust on the macro level have been proposed, robust empirical evidence is still lacking. The two most widely used theoretical underpinnings are the stratification and the perception effect (Steijn and Lancee, 2011).

The stratification effect describes the reduced interactions among people in societies with high levels of income inequality. As a consequence of this lack of interaction people in different income groups lose an understanding for the other groups' needs, interests, and preferences (Olin-Wright, 2015) resulting in a growing divergence of values and beliefs. As people feel closer to those who share their values (Rokeach, 1968), they will be less inclined to trust those of other income groups.

The perception or perception of inequality effect, on the other hand, posits that the found relationship is less about the actual level of income inequality and the interaction of people, and more about how people perceive the level of income inequality in terms of fairness. High inequality is said to be perceived as unfair, because it is rooted in factors the individual has no control over and thus cannot change. The system and those others who are benefitting from the system are to be blamed for this unfairness (Uslaner and Brown, 2005).

Research on the income inequality – trust relationship has hitherto failed to directly test the proposed underlying mechanisms. Regarding the stratification effect, heterogeneity in terms of ethnicity and religion were utilised and linked to income inequality and trust (Alesina and La Ferrara, 2002; Leigh, 2006a; Leigh, 2006b). Yet, increasing heterogeneity in terms of growing value incongruence, was never directly tested. The same can be observed for studies attempting to test the perception effect. Whilst various proxies were used – assumed level of income inequality (Stein and Lancee, 2011), causes of income inequality (Uslaner and Brown, 2005) and age-cohort comparisons (Stephany, 2017) – people were never *directly* asked about their perceptions in terms of fairness.

Empirically investigating how intra-workplace pay inequality relates to direct measures of perceptions of fairness and to the perception of shared values as a proxy for the stratification effect, and in turn employee trust in managers, is a crucial contribution. First, an important

factor responsible for the increasing wage inequality is the rise in incomes of top earners (Atkinson, 2015; OECD, 2011; Piketty, 2014; Stiglitz, 2015). Piketty (2014) calling it the “Rise of the Supermanager”, due to the vast increases in pay of top managers. In the USA the ratio between compensation of executives or CEOs and that of the average worker was 20:1 in 1965, reaching its peak at 381:1 in 2007 before slightly decreasing to a current level of 321:1 (Mishel and Kandra, 2020). Similar trends can be found in the UK, 190:1 (The Equality Trust, 2017), and in countries like Germany and Switzerland, where the ratio has reached levels of around 140:1 (Kiatpongsan and Norton, 2014). Yet, the explosion of top salaries, and with it the rising level of intra-organisational pay inequality, is not based on productivity differences but rather on external factors (Bebchuck and Fried, 2003; Bertrand and Mullainathan, 2001; Piketty, 2014; Tatton, 2014). Bebhuck and Fried (2003) argue that next to market forces, managers use their power and influence over remuneration and advisory boards to obtain more favourable outcomes for themselves. In that way, the authors show, managers received pay packages that “did not link pay tightly to the managers’ own performance” (Bebchuck and Fried, 2003: 76). Similarly, Bertrand and Mullainathan (2001), using three measures of luck – commodity price changes, industry-specific exchange rates and mean industry financial performance – find that CEO pay is more sensitive to luck than to general performance measures. Although the executive-to-average worker pay ratio is only *one* particular measure of pay inequality that focuses on the upper extremes, its stark increases invite questions about employees’ perceptions regarding the fairness of pay inequality increases on the one hand, and the role of shared values that might help to explain the acceptance of these developments on the other (Piketty, 2014; Sandel, 2020).

Second, considering Stephany’s (2017) proposition that fairness perceptions around inequality are based on reference groups further supports the aim of the research in studying the relationship between income inequality and trust on the workplace level. A person’s workplace constitutes an environment full of comparison opportunities with colleagues and supervisors in matters regarding outcomes such as pay as well as inputs such as effort, experience or responsibility (Greenberg et al., 2007). Or to use the words of Brown et al. (2001: 15): “If we look inside the firm, the stability of the pay structure becomes even more important. Employees’ sensitivity to relative pay is all the more acute because they are in daily contact with the people in their comparative reference groups”. Since the perception of inequality effect relates to the view that some people got ahead of others due to unfair reasons outside the control of that person in the unfavourable position, studying the relationship between pay inequality and trust in the workplace level offers the chance to investigate this underlying mechanism in

an environment with potential references groups in a more clearly defined place of socialisation.

The specific case of studying employee trust in *managers* is also important to increase our understanding of this effect. Next to the regular interaction managers have with their employees, they are partly responsible for pay decisions, and have the ability to explain these decisions to employees in an effort to increase employees' understanding and positively affect their fairness perceptions (Bies and Shapiro, 1987). The second research questions I intend to answer:

2. How do shared values and fairness perceptions relate to both intra-workplace pay inequality and employee trust in managers? Is pay inequality associated with a divergence in values in line with the stratification effect or accompanied by increased feelings of unfairness? Are these two proposed mechanisms mutually exclusive, as suggested in previous research, or potentially interrelated?

However, it would be naïve and superficial to attribute managers the absolute power to make decisions around pay (Brown et al., 2001). Next to market forces of labour demand and supply (Scheidel, 2017), there are labour market institutions that affect the distribution of pay (Checci and Garcia-Peñalosa, 2008). Yet, how might these affect the intra-workplace pay inequality – employee trust in managers relationship?

1.3 The potential role of labour unions in shaping fairness perceptions and trust

Next to the aforementioned proposed theoretical explanations, the role of (labour market) institutions in the relationship between income inequality and trust on the country level is an important aspect to consider when aiming to understand employee-management relationships.

Next to decreasing levels of trust, increases in income inequality coincide with the decline of trade union power and collective bargaining coverage, resulting in a general shift in power from workers to employers (Atkinson, 2015). Particularly the decline of collective bargaining systems can explain a significant part of the growing income inequality levels in a majority of countries (Atkinson, 2015; Card et al., 2004, 2013; Förster. and Tóth., 2015; Visser and Checchi, 2011). Next to reducing income inequality on the macro (Atkinson, 2014; Piketty, 2014; Stiglitz, 2015) and organisational level (Card et al., 2013; Metcalf et al., 2001), labour unions are also said to establish transparency and procedural fairness through collective bargaining agreements (Kaufman, 2005). Considering the influence labour unions have on pay inequality, exploring the role of this institutional actor seems an important endeavour in

understanding how employees view inequality and as such their managers. Such an understanding is vital for developing strategies and policies to improve trust in the workplace through institutional means.

Again, investigating how labour unions enter the picture is best studied on the workplace level, where it is possible to observe in more detail in which ways unions are involved in pay matters and in the relationship between employees and managers. These nuances would be lost by aggregating the role of unions on the country level (OECD, 2019). Is it really, as has been repeatedly found on the macro level, that unions simply reduce pay inequality, or might their role be more complex; for instance, also influencing the perception of inequality by establishing procedural fairness, the opportunity to engage with reference groups by increasing transparency and the interaction between employees and managers by offering a channel of communication, and thus trust? Exploring these questions contributes to the role of labour unions as for a) the perception of pay inequality, and b) the employee-manager relationship. This leads to the third research question:

3. Considering the important role of labour unions in reducing income and pay inequality by being a voice for workers, what role do they play in the intra-workplace pay inequality – trust relationship?

1.4 Implications of trust for the pay inequality – organisational performance relationship

Trust has been linked to various positive outcomes within organisations. On the individual level, higher levels of trust related to more job satisfaction, commitment and extra-role behaviour (Choi, 2011; Matzler and Renzl, 2006; Top et al., 2015). These employee attitudes, in turn, have been found to increase individual and organisational performance (Bryson et al., 2017; De Gieter and Hofmans, 2015; Kim and Brymer, 2011; McClean and Collins, 2011). Next to these indirect relationships, trust has also been directly associated with individual, organisational and workplace performance (Brown et al., 2015; Colquitt et al., 2007; Sharkie, 2009; Tzafrir, 2005). By empirically investigating the relationship between intra-workplace pay inequality and employee trust in managers, this research deals with broader questions around the role of pay inequality for workplaces.

One of the much-debated relationships in organisational research is that between intra-organisational pay inequality and organisational performance. Shaw (2014, p. 535), in his review of the effects of pay dispersion, concludes that “the nature of the [inequality-

performance] relationship (negative, positive, or null) is difficult to predict in advance”. By investigating how intra-workplace pay inequality relates to fairness perceptions, shared values and trust, this PhD project aims to contribute to this ongoing debate. The fourth research question this PhD sets out to answer is, thus, the following:

4. If there is indeed a significant relationship between intra-workplace pay inequality and employee trust in managers, how does this influence our theoretical understanding of the pay inequality – workplace performance relationship?

1.5 Structure of this PhD thesis

Each of the four research questions will be investigated in a separate chapter. This first chapter should thus be seen as a broad introduction to the overall aims of this PhD research, which will be followed by chapters that engage with each research question in detail.

Chapter 2 discusses the research design employed in this PhD research project. First, I position the investigation of the four research questions in a critical realist ontology and epistemology. I posit the 2011 Workplace Employment Relations Study (WERS) as the best available option to study the four above-mentioned research questions, because its multilevel structure aligns with both, the multilevel theoretical approach and a critical realist approach to research. Whilst trade-offs must be made when choosing a research approach, referring to external, measurement and internal validity, I argue that the 2011 WERS provides most benefits for the aims of this research.

Chapter 3 investigates the direct relationship between intra-workplace pay inequality and employee trust in managers. With the aim of investigating this type of interpersonal trust situated in an organisational context, I start with the development of a concept of employee trust by critically reviewing and analysing previous conceptualisations of interpersonal trust. This analysis puts forward the social exchange between employees and managers as the crucial process whereby employees come to judge the trust relationship with their managers in terms of shared values, attitudes, and emotions. Having defined what trust is, the chapter continues with a detailed review of the income inequality – trust literature on the macro level. This highlights the contribution of this PhD in exploring how pay inequality affects the trust employees have in their managers at the workplace level. It sets out Adams’ (1965) theory of *Inequity in Social Exchanges* as the main theory to derive propositions for the association between intra-workplace pay inequality and employee trust in managers, leading to the

hypothesis that the relationship is inversely U-shaped. To test this hypothesis, I utilise the 6th wave of the Workplace Employment Relation Study, a large-scale employer-employee matched survey representative of workplaces in Britain. Results support the hypothesis of an inversely U-shaped relationship between intra-workplace pay inequality and employee trust in managers, with an inflection point at a Gini coefficient of 0.25. Implications for theory and practice are discussed.

Having established a curvilinear, inversely U-shaped relationship between intra-workplace pay inequality and employee trust in managers, Chapter 4 explores the underlying mechanisms for the found relationship. The macro level literature on the income inequality – trust relationship has predominantly focused on two theoretical explanations, one relating to perceptions of fairness and the other to the change in values and preferences due to a loss of interaction between income groups. These mechanisms are further investigated looking at the relationship between values and fairness perceptions, and the role of social comparisons as a tool to judge fairness in pay. It is hypothesised that a) fairness perceptions mediate the direct relationship in a curvilinear way, and b) there is a serial mediation running from pay inequality to fairness perceptions, continuing to shared values and ending in employee trust in managers. The hypotheses are tested using the Workplace Employment Relations Study. Results suggests that perceived manager fairness mediates the relationship between intra-workplace pay inequality and employee trust in managers, and that the mediation relationship is also inversely U-shaped. In line with the findings for the direct relationship, the inflection point after which the relationship between intra-workplace pay inequality and perceived manager fairness turns negative is at a Gini coefficient of around 0.25. Moreover, shared organisational values partially mediate the relationship between perceived manager fairness and employee trust in managers.

In Chapter 5, I follow up with research question 3 on the moderating role of labour unions. Through collective bargaining agreements, labour unions are posited as both, a way of establishing a degree of pay transparency and as an important factor for procedural fairness. Drawing on organisational justice literature around the “fair process effect” and linking it to literature of employee union voice, I argue that the voice function of collective bargaining should moderate the direct and mediated relationship positively. However, since the perception of fairness depends on the perceived effectiveness of labour unions, of which one is the

establishment of a fair distribution of pay, I argue that the positive effect has its limit, at some point turning negative. I, thus, hypothesise collective bargaining to moderate the direct relationship between intra-workplace pay inequality and trust, and the mediation relationship between pay inequality and fairness perceptions in a curvilinear way. These hypotheses are tested using the Workplace Employment Relations Study. Results are generally supportive of a positive moderation, but highlight that the relationship plateaus or turns negative after pay inequality passes a Gini coefficient of around 0.3.

In light of the found direct and mediation relationship in chapter 3 and 4, chapter 6 embeds these findings in the ongoing discussions on the relationship between intra-organisational pay inequality and organisational performance. The lack of non-linear hypotheses and approaches is criticised by reflecting on the role of fairness perceptions and trust. Moreover, to tap into the issue of performance measures, I utilise two different types of performance measures, perceptual and accounting-based, both available in the Workplace Employment Relations study. Results produce a mixed picture, depending on the measure used and the statistical methods employed. Implications for theory, methodology and practice are discussed.

Chapter 7 concludes this PhD thesis, by recapping the research objectives, general findings and overall implications, before outlining limitations and suggestions for future research.

Chapter 2: Research Methodology

This PhD research is based on a critical realist understanding of the world and the discovery of knowledge. Adopting this view implies that intra-workplace pay inequality should be treated as a material phenomenon that can be observed and measured. Yet, simultaneously as one that people, in this case employees, socially construct in terms of perceived fairness. This, as a corollary, necessitates data that captures both workplace level material inequality and an individual employee's perception. I incorporate this reasoning into Roy Bhaskar's Transformational Model of Social Activity to argue in favour of relationships of cause and effect. However, these relationships do not describe universal laws but only tendencies, which are contingent on structural factors of time and space, culture and history, and are always provisional. Similarly, a found tendency only describes one of many factors of an outcome and should not be treated as the *one* underlying cause. The aim of this research is to identify potential tendencies between phenomena on two strata of reality. Survey data on pay inequality and perceptions of fairness are argued to be suitable to establish such tendencies to answer the aforementioned research questions. This will open the door for future research to explore underlying causal mechanisms through qualitative or mixed methods research.

Following the outline of my philosophical stance, I propose a deductive quantitative approach using large-scale multilevel survey data for the UK, the 2011 Workplace Employment Relations Study (WERS). The usefulness of the WERS for the research objectives of this PhD research are discussed in respect to external, measurement and internal validity of the data. Its large-scale sample, good methodological fit, and its multilevel structure are weighed against primary data collection with increased methodological fit and other panel surveys representative of the UK population. It is concluded that primary data collection, with the resources available to me as a PhD student, does not allow for a large enough sample to draw any meaningful conclusions about intra-workplace pay inequality for the population of UK workplaces, whilst other surveys are not able to adequately operationalise the phenomena of interest for this research. The multilevel design of the WERS, in line with the critical realist view, allows to model the influence of structural and cultural factors on the employee's perception of inequality and trustworthiness of managers by accounting for the employee's embeddedness in her respective workplace. Multilevel modelling also corrects for both statistical and theoretical issues that arise when aggregating individual level data in a multilevel theoretical framework.

To capture a) these group dynamics, b) the hypothesised non-linear effect of pay inequality on employee trust in managers, and c) how employees construct pay inequality in terms of fair treatment, for the analysis, I will employ multilevel moderated mediation analyses with a quadratic term as well as machine learning algorithms which are better at establishing complex non-linear relationships. For research question 4, the intra-workplace pay inequality – workplace performance relationship, weighted linear and logit regression models are proposed in combination with machine learning methods.

2.1 Research Approach

Before turning to the research design – the type of data used, the collection method, and the analysis of the data – the following section will introduce the assumptions made about the nature of reality. An understanding of what constitutes reality, from here on referred to as ontology, is the necessary prerequisite to develop an understanding of a theory of knowledge and knowledge generation, i.e. epistemology (Bhaskar, 1975). With the aim of investigating the role of intra-workplace pay inequality in employee trust in managers, and the underlying mechanisms, confounding factors, and further implications, I am essentially interested in the social world, as opposed to the natural world¹. A discussion around ontology and epistemology will pave the way for the choice of research design.

2.1.1 The interplay of structures and human agency

Andrew Collier (1994: 145) explains Roy Bhaskar’s Transformational Model of Social Activity, wherein Bhaskar outlines social reality, in the following way:

“Societies (composed as they are of relations between people, and ramifications of those relations) can only exist as the outcome of human agency. If we were not reproducing/transforming social relations all the time, they would not exist... But all human action presupposes the pre-existence of society and makes no sense without it. Its social context determines what actions are possible and what outcomes will be.” (Collier, 1994 p. 145)

¹ It is not the aim of this PhD to enter a discussion on the differences between these two. For those interested, read Bhaskar (1975) or Collier (1994) in its entirety.

Viewing social reality as such helps us to move away from this ‘one-way-road-thinking’ of how the world works towards a more interactive and reflective picture of the dynamics of society. It shows that society and human agency are two distinct entities. Yet, they are mutually dependent entities that together constitute reality. There are two parts of the coin, and we need both to make sense of the world we live in.

The predominant view in social constructionism is that social structures do not independently exist of the human mind. They are the outcome of our different views and perceptions and thus relative, in that we all construct their meaning in a different way. This is highlighted in our discourses and ultimately language (Burr, 2015). However, in an effort to remedy the critique that such an ontology omits material realities of pleasure, pain or oppression, one stream of social constructionist scholars – some clearly admitting their critical realist understanding (Willing, 1999; Elder-Vass, 2012), others not explicitly mentioning it (Burkitt, 1999) – propose a more moderate form of social constructionism. Burkitt (1999) argues in favour of a material reality that exists beyond the discourse. According to him, people may form social constructs *through* means of material artefacts. For this research this would imply that intra-workplace pay inequality is part of the material reality, which can be measured in various ways. Employees then use this material level of pay inequality and deconstruct it socially as, for example, fair or unfair, value-congruent or value-incongruent.

Elder-Vas (2012) agrees with Burkitt (1999) that both material and social entities exist independent of human thought and language, but he goes a step further to argue that there might even be causal relationships. In line with the aforementioned Transformational Model of Social Activity, Elder-Vas (2012) posits that social norms, which influence how people talk and what they do, are real structures with causal powers. Yet, they are the result of dominant discourses and can therefore be transformed through human agency. These normative forces stress the historical and cultural embeddedness of individual’s actions and perceptions in society (Burr, 2015). Thus, how an employee perceives pay inequality cannot be unilaterally defined by an employee’s individual characteristics, but also depends on the employee’s embeddedness in the workplace and its culture, as well as the culture of her surroundings and/or country during the time of data generation. Put another way, structural characteristics, in the words of critical realism, or cultural and historical dependence in the words of social constructionism, shape human action and perception. This implies that how most employees perceive or socially construct pay inequality is influenced by the prevailing dominant discourses, that is norms. Such a view requires the researcher to be aware of and take into account the currently prevailing

discourse around perceptions on pay inequality, in an effort to deduce the causal powers it might have for human interaction in the form of employee trust in managers.

2.1.2 Demi-regs, multiple strata and the statistical analysis of survey data

In an open, social reality which is constantly changing due to the interplay of human agency and structure, for Bhaskar, there cannot be a ‘single cause’ for an event or tendency to occur, but instead there are multiple factors, all of which are bound to certain conditions (Collier, 1994). As a result, there are no universal laws but only observable tendencies which are context dependent (Collier, 1994; Kemp and Holmwood, 2003). That is to say, what might be found in one region of the world at a particular time, might not hold for another region at the same time or the same place or region at another point in time.

For Bhaskar scientific discovery is a two-step process. First, one needs to identify “law-like behaviors” (Collier, 1994: 163), or as Lawson (1997) calls them: demi regularities. This implies that when looking a demi-regs which place the social event in space and time, these events “on Bhaskar’s terms, should be described as closed during the period of time in which this regularity applies” (Kemp and Holmwood, 2003: 178). Second, scientists need to identify the underlying structures that produce these demi-regs. This approach to scientific discovery recognises the existence of a stratified world, whose levels can be divided into the *empirical*, the *actual*, and the *real*. Before one can explain a social phenomenon through the subjective view of an individual at the actual level, what social constructionists aim to do (Nightingale and Cromby, 1999), the phenomenon needs to be identified through demi-regs on the observable, e.g. empirical level. Therefore, before I can venture into the question of how employee’s perceive pay inequality and how this influences the trust they have in their managers, I need to establish some form of time and place contingent regularity based on an objective measure of income inequality.

The choice of methods to identify such demi-regs is a heated debate among critical realists. Lawson (1997) or Sayer (1992) argue against the use of quantitative statistical methods on ontological grounds. Analytical statistics, they argue, is a closed method aimed and detecting regularities, and are thus not appropriate to investigate social reality of an open system ontology. Yet, Olsen and Morgan (2005) convincingly defuse this argument, stressing that a method, such as analytical statistical analysis, should not be confused with a methodology. It is about the “*practice and attitude* of the person who is using analytical statistics” (Olsen and Morgan, 2005: 261, italics in original), hence about their ideological understanding of conducting scientific research, not about analytical statistics per se. As a corollary, analytical

statistical analysis, such as the analysis of large-scale survey data, can allow for meaningful conclusions about social phenomena if they are “informed by a critical realist understanding of ontology” (Olsen and Morgan, 2005: 262). Porpora (2001: 262) summarises this point when arguing that “what distinguishes realism from positivism is not that they run regressions and we do not, but how we run regressions and the significance we attach to them”. For example, if the researcher acknowledges the time-space contingency in which an event or phenomenon displays a certain regularity, the statistical analysis of survey data can be said to be closed for this particular time and space in which the regularity was detected because, according to Bhaskar (1997: 3), “a closure is of course always relative to a particular set of events and a particular region of space and period of time”.

In that sense, quantitative statistical methods, which are able to control for a variety of other influencing factors based on prior knowledge, can suggest a regularity between two factors. The found isolated correlation between the two factors might not infer any causality (Cunningham, 2021). Yet, it suggests a space- and time-contingent regularity which triggers further investigation into the underlying causal mechanisms that are responsible for the found demi-reg. Therefore, although the statistical analysis of survey data might not be able to capture all causal factors that represent reality because some of them are not directly observable, and are thus subject to error (Kemp and Holmwood, 2003; Olsen and Morgan, 2005), this method is “useful in providing traces and outlines of an underlying reality” (Charlwood et al., 2014: 158). Moreover, conclusions drawn from the results of the analysis are not definite but are provisional on new evidence, both in respect to demi-regularities and potential underlying mechanisms (Olsen and Morgan, 2005).

Returning to the aims of this research, adopting such a critical realist epistemological approach implies that statistical analysis of survey data may be one method to see whether a space-time-contingent regularity between intra-workplace pay inequality and employee trust in managers can be identified, controlling for, by way of deductive reasoning, other factors that might influence the two factors. One way of capturing the embeddedness of employees, whilst also maintaining their individual views and to determine a degree of regularity, is the use of multilevel survey data. As I will outline in more detail in the sections that follow in this chapter, studying the research questions using large-scale survey data for the UK at a specific point in time, and considering the employee as embedded in their workplace dynamics, can support the identification of demi-regs for the relationship between intra-workplace pay inequality and employee trust in managers.

In a second step, I will then attempt to further probe into one factor of the found relationship between material intra-workplace pay inequality and employee trust by looking at how employees socially construct pay inequality in terms of fairness and shared values and how the context of collective bargaining shapes employees' fairness perceptions. Any conclusions drawn from this analysis are provisional, subject to new empirical evidence. The second step of trying to explain the regularity by identifying underlying causal mechanisms should then involve induction or mixed methods research (Charlwood et al., 2014; Kemp and Holmwood, 2003; Olsen and Morgan, 2005). In this research, I will engage in the first part on the more quantitative nature of mixed methods, following a deductive quantitative approach, analysing large-scale survey data that focus more on the prevailing dominant discourse on the role of fairness perceptions, shared values and labour unions in the intra-workplace pay inequality – employee trust in managers relationship instead of the divergence views and discourse around these phenomena. As such, I am following Elder-Vas' (2012) argument that dominant discourses which turn into social norms function as real social structures that have causal powers in that they influence how people behave, talk and think.

The aim is thus to establish demi-regularities on two strata of reality. The first relates to the observable relationship between material intra-workplace pay inequality and employee trust in managers. If a demi-regularity can be established, how can the prevailing norms around inequality in the current times and region of analysis help to explain the demi-reg in terms of fairness and shared values? And what might be confounding factors and outcomes of this demi-reg? For this we move to a lower strata, to understand how employees perceive pay inequality in terms of the social exchange with their managers, and how this might change depending on the presence of labour unions and collective bargaining regimes. The use of statistical analysis, in this case cross-sectional multilevel survey data, might not be able to identify the causal mechanisms for the found regularities but “the search for such patterns can be an important part of the process of identifying causes operating in the social world” (Kemp and Holmwood, 2003: 179). If this PhD can establish demi-regs for the four research questions, future research should apply more inductive approaches to understand the underlying mechanisms for the found relationships.

Having established that the statistical analysis of survey data can help to identify demi-regularities on two strata of reality, which are contingent on a specific space and time, and should be viewed as provisional, in the following sections I will outline what data I will use specifically, why the data is arguably suited for studying the research questions this PhD seeks

to answer – weighing up benefits and costs – as well as the particular statistical methods and the reason for choosing these methods to analyse the data.

2.2 Research design

In this PhD thesis, I employ the 6th series of the Workplace Employment Relations Study (WERS) - the 2011WERS – to investigate the relationship between intra-workplace pay inequality and employee trust in managers using a deductive quantitative approach. The WERS is a large-scale survey on employment relations and working conditions of workplaces in Britain. It is jointly financed by the Department for Business Innovation and Skills (BIS), the Economic and Social Research Council (ESRC), the UK Commission for Employment and Skills (UKCES), the Advisory, Conciliation and Arbitration Service (Acas), and the National Institute of Economic and Social Research (NIESR), and covers a large variety of key employment relations aspects including, but not limited to: workplace and organisational characteristics, pay systems and pay determination, management of employment relations as well as employee well-being, engagement and job satisfaction.

Generally, quantitative survey-based trust studies have been shown to work well to investigate the nature and extent of trust relationships (Welter, 2012) and are the dominant approach in scholarly work on organisational trust (Lyon et al., 2015). In line with Charlwood et al.'s (2014:159) fifth of “six principles to guide quantitative sociological research”, I will critically reflect on the strength and weaknesses of the chosen survey data, type of data analysis, and the validity of the results stemming from the analysis of the data. The 2011 WERS was chosen for its large sample size, its multilevel design and its methodological fit in relation to the aims of the research. These strengths must be weighed against superior methodological fit when gathering primary data and using established psychometric multi-item constructs on the one hand, and other representative data sets that allow for stronger causal inference due to their longitudinal nature, on the other hand.

2.2.1 WERS multilevel design

One of the main advantages of the WERS for the nature and aims of this research is its multilevel design. Conducting multilevel research in organisational studies has been highlighted as “fundamental to understand real-world phenomena” (Lopes Costa et al., 2013: 1; see also Anguines et al., 2011; Kozlowski and Klein, 2000; Molina-Azorín et al., 2019). A multilevel approach helps to capture the embeddedness of employees within higher levels units, such as

teams, working-groups, divisions, workplaces and/or organisations (Rousseau, 2011) and to understand how group membership might affect individual behaviours and outcomes (Bliese et al., 2007). By investigating the intra-workplace pay inequality – employee trust in managers relationship, this PhD research takes such a multilevel lens when exploring how employees perceive not only their own pay, but their pay *in relation* to those of their co-workers in the workplace, and what this means for the trust they have in their managers. As such, the employee is not treated as a purely independent entity but as an individual influenced by the social context of her workplace (Hox and Roberts, 2011).

It is fundamental that these theoretical multilevel considerations are aligned with the appropriate level of measurement and analysis to draw reliable conclusions resulting from the findings (Mathieu and Chen, 2011). With the aim of understanding how intra-workplace pay inequality affects employee trust in managers, perceived fairness, shared values, how these aspects are influenced by unions involvement in pay matters through collective bargaining, and what this ultimately implies for workplace performance, I require data that measure pay inequality, union involvement and performance on the workplace level, and employee trust, fairness perceptions, and shared values at the individual level. The WERS, as opposed to other UK panel studies, does precisely allow for that, by measuring workplace aspects through an interview with a senior manager in the Survey of Management, and individual employee aspects by directly questioning them in the Survey of Employees. These surveys are then matched by a workplace identifier which is present in both surveys, resulting in the WERS' multilevel design with individual employees nested in their respective workplaces.

Next to the alignment of theory and measurement, it is crucial to decide on the appropriate level of analysis, that is data analysis that allows the incorporation of multiple levels (Mathieu and Chen, 2011). In the past, before the acceptance and use of multilevel models to study variables at different levels, data was typically either aggregated or disaggregated. Both options are problematic for the aims of this research.

The approach of aggregating has also been common in previous research using the WERS. In their study on the relationship between different forms of employee voice, employees' perception of managerial responsiveness and workplace productivity, Bryson et al. (2006) aggregate individual employee perceptions of manager responsiveness by computing mean scores for each workplace. The same was done when studying the effect of employees' subjective wellbeing on workplace performance (Bryson et al., 2017) as well as in Brown et

al.'s (2015) work on the effect of employee trust and managers on workplace performance. For these authors aggregating was suitable approach because, as for instance Bryson et al. (2017) state, they are not interested in individual level wellbeing and individual performance but in the relationship between workplace level average wellbeing and workplace performance. Contrary to their approach, this research is interested in how intra-workplace pay inequality affects *individual* level employee trust in managers, perceived fairness and shared values. By aggregating these individual level variables to the workplace level, I would eliminate variation in trust, fairness and shared values within workplaces between employees and would only analyse variation between workplaces (Rousseau, 1985; Hox, 2002; Hitt et al., 2007; Mathieu and Chen, 2011). This implies that any relationship found at the workplace level, could not be transferred to the individual level. To put it differently, the approach of aggregating takes a more utilitarian approach, which averages individual level differences, whilst multilevel models take into consideration the employee level differences and how these are shaped by their respective workplace.

Problems also arise when one disaggregates data from the workplace to the employee level. One of the key assumptions for unbiased linear regression coefficients, the independence of independent variables from the error term, would be violated (Cohen et al., 2003). Since employees that are nested in the same workplace are likely to be more alike than those across different workplaces, the independence assumption is violated (Huang, 2018). By not accounting for the correlation between the error term and the independent variables in the model, the resulting standard errors for each coefficient are underestimated (Bell et al., 2019) which increases the likelihood of type I errors, that is false positives in terms of significance. One way of dealing with this issue is the use of robust clustered standard errors (McNeish et al., 2017). Clustered standard errors *correct* for the underestimation of standard errors due to the presumed similarity of individual level observations. Contextual effects are thus treated as a nuisance that needs to be accounted for when analysing data on a single level. Multilevel, random effect models, on the other hand, explicitly *model* the variation within each group, by allowing to explain differences in the intercept and/or slope by higher level variables (King and Roberts, 2017). Another common alternative to deal with the issue of independency of the error term in single-level models, is the inclusion of dummy variables for the higher-level entities (Huang, 2018). However, such models treat all level-2 entities as unconnected, each with its own separately estimated coefficient.

Using multilevel analysis remedies the violation of this assumption and the aforementioned problems of aggregation by accounting for variances and two levels: level-1 (individual), level-

2 (workplace). In other words, the analysis takes into account the effect of variances on the workplace level of individual level differences. This does not only deal with the statistical fallacies described, but it is also in line with the critical realist approach taken in this research: being aware and integrating the influence of context for relationships between people.

2.2.2 External validity: large scale survey data and sampling weights in multilevel models

Another core strength of the 2011 WERS, relates to its sample size, covering close to 22,000 employees nested in around 2,680 workplaces, and its representativeness of the population of British workplaces. This in itself constitutes a contribution to the field of trust in organisations, which is dominated by workplace or sector case studies (see meta-analyses by Colquitt et al., 2007; Dirks and Ferrin, 2001; McEvily and Tortoriello, 2011). Whilst meta-analyses stress the “cumulative rigor” (MacCouns, 2005: 173) of the findings of these case studies, they do not allow to draw inferences about the population. The 2011 WERS thus ensures relative strong external validity of the findings (Bryman, 2016). Distributing one’s own survey would have made it nearly impossible to reach a large-scale representative sample. The time and costs involved in having such large-scale multilevel data of employees nested in workplaces would have been outside the financial and temporal scope of this PhD research project (Bryman, 2016; Dale et al., 1988; Easterby-Smith et al., 2021).

It has to be pointed out, however, that the 2011 WERS data is not based on a simple random sample, because both large workplaces and workplaces in less-populated industries such as utilities were oversampled relative to small workplaces and those from more-populated industries such as retail and wholesale. In a similar manner, employees from small workplaces had a higher probability of being selected compared to those from large workplaces. To account for these sampling biases and to ensure representativeness, sampling weights were included in the dataset. In this research I analysed both weighted and unweighted samples because either approach has advantages and disadvantages when employing multilevel models.

First, multilevel analysis models the different effects of different clusters, thereby accounting to some degree for the difference across workplaces, such as size or industry. Someone following a model-based approach would judge this as sufficient because “the actual finite population from which the sample is drawn is considered a realization of the infinite possible ones from the specified superpopulation model” (Cai, 2013: 180). However, when aiming to make inferences about the population as a whole, from a statistical perspective, ignoring the unequal sample inclusion probabilities can lead to biased estimates. Whilst

weighting for single-level models is well-established, how to include sampling weights in multilevel models (MLM) is still much debated (Asparouhov, 2006; Cai, 2013; Carle, 2009; Mang et al., 2021; Stapleton, 2002). Cai (2013) shows that even models that allow for the inclusion of 2-level weights, such as multilevel pseudo-maximum likelihood approaches, “may still produce biased estimates on the intercept and variance of random effects and slightly underestimated fixed effect and residual variance” (p. 179). One of the reasons for the biased estimates when weights are included stems from the fact that level 1 weights need to be rescaled to adequately capture the multilevel nature of the sampling bias (Stapleton, 2002). Without rescaling the weights, coefficient variances are likely to be biased (Carle, 2009; Mang et al., 2021), which leads to biased t-statistics and confidence intervals, making statements about statistical significance problematic. A detailed description on the scaling methods used in this PhD will be provided in the empirical chapters. In sum, these debates illustrate that whilst it is more complex to include sampling weights in multilevel regression models, as long as the weights are rescaled adequately, the sampling bias can be remedied.

Next to the statistical aspect, there are also theoretical consideration when it comes to the inclusion of sampling weights. By not including sampling weights, conclusions drawn from the regression results will not be representative of *all* British workplaces, but biased towards medium or large workplaces, and those in smaller sectors such as utilities. The increased focus on larger workplaces has some specific advantages given the questions under investigation in this PhD research. Including weights would reduce the importance given to larger workplaces and instead put more emphasis on smaller ones. This might be problematic because pay inequality is likely to be more important for employees in larger workplaces for several reasons. First, the rise of intra-firm pay inequality, as described in the introductory chapter, manifests itself predominantly in large establishments, which, on average, display greater levels of pay inequality (Mueller et al., 2017). Another reason why intra-workplace pay inequality might be more important for medium and large workplaces relates to the relationship and social exchange between employees and managers in workplaces of different sizes. Whilst the personal relationship between employees and managers is much more important in small establishments (Matlay, 1999), thus having a stronger emphasis on non-monetary aspects, one is more likely to observe the opposite in large establishments (Rynes et al., 2004). The focus of this research and its relevance thus relate predominantly to medium and large workplaces. Relationships that would be visible in a larger sample of medium and large workplaces, may thus be obscured when including the sampling weights.

One way to reconcile these two issues is to also look at a subset of only medium and large workplaces and include sampling weights in the analysis. Comparing the unweighted full sample with the weighted full sample and the weighted sub-sample of medium and large workplaces allows to test the assumption that the effect of intra-workplace pay inequality might manifest itself predominantly in larger workplaces. In each empirical chapter that follows, this is the approach I will take.

Referring back to above-mentioned epistemological approach, using both large-scale and representative survey data, it will be possible to establish some demi-regularities for the relationship between intra-workplace pay inequality and employee trust in managers and to then further investigate employee perceptions of pay inequality through the extensive measures that the WERS provides.

2.2.3 Measurement validity

Using secondary large-scale data such as the WERS does not come without its caveats when compared to primary survey data collection. First, a tailor-made survey to gather primary data would limit the questions asked to the needs of this particular research project, which would decrease the cognitive load for survey participants stemming from long surveys (Galesic and Bosnjak, 2009). In a similar manner, it would have allowed to design a survey that reduces the probability of common method variance in the data. As will be shown in chapter 4, I did, however, test for the problem of common method variance, making this supposed advantage less relevant. Second, developing one's own survey to gather primary data instead of using secondary data would have improved methodological fit in terms of the multi-item constructs to measure the multiple dimensions of trust, perceived fairness and shared values (Lyon et al., 2015). I could have included items on the willingness-to-be-vulnerable component of trust, positive expectation and direct questions (Colquitt et al., 2007). For example, I could have utilised Cumming and Bromiley's (1996) Organisational Trust Inventory, on whose definition the thesis partly rests upon, or Mayer and Davis' (1999) measures that differentiate between trust, the willingness to be vulnerable, and trustworthiness, the positive expectations attached to the trustee. This is an important limitation because despite the vast growth in organisational trust literature in the past five decades, a misalignment between theory and measurement has become a common issue (Korsgaard et al., 2015). Rather than linking the presented conceptual definition of trust to its operational definition, most trust research describes the one and does the other (Currall and Judge, 1995; Gillespie, 2003; Gillespie, 2015). For instance, Mayer,

Davis and Schoorman's (1995) definition of trust as the willingness to be vulnerable to the other party's actions based on positive expectations is by far the most widely used definition on organisational trust (McEvily and Tortoriello, 2011). Yet, very rarely do researchers use the "willingness to be vulnerable component", which Mayer et al. (1995) define as actual trust, and instead opt for a measure of perceived trustworthiness (Dietz and Den Hartog, 2006; Dirks and Ferrin, 2002; McEvily and Tortoriello, 2011).

The inability to reach this level of detail when measuring trust notwithstanding, the 2011 WERS allows for good methodological fit, i.e., the alignment of theory and measurement (Edmondson and Mcmanus, 2007). In this PhD research, I utilise the definition of trust as an individual's belief that another individual "makes good faith efforts to behave in accordance with any commitments ..., is honest, and does not take excessive advantage of another even when the opportunity is available" (Cummings and Bromiley, 1996: 303). This definition emphasises the positive expectation about the trustee's action, which is shaped by values, beliefs, attitudes, moods and emotions (Jones and George, 1998). Adopting this concept and definition of trust has two implications. It implies that trust the trustor (the party who trusts), has in the trustee (the party to be trusted), or in this case the perceived trustworthiness of the trustee, cannot be directly seen or observed (Lewicki and Brinsfield, 2015). As a corollary, when attempting to measure trust, the researcher needs the participant to express her inner psychological state. This approach necessitates the researcher to measure trust on the individual level, as only the individual employee herself can give information about this psychological state.

The WERS fulfils these conditions. In the Survey of Employees, participating employees are asked multiple questions about their individual view on their managers, which follows a positive expectation approach. The value of using the WERS to study employee trust in managers is further substantiated by previous empirical work in highly regarded peer-reviewed journals (see for instance: Brown et al., 2015; Innocenti et al., 2011; Timming, 2012). Brown et al. (2015) used the aforementioned items from the Survey of Employees to investigate the relationship between aggregated workplace level trust and workplace performance. Timming (2012) utilised the same items as Brown et al. (2015) for trust as the outcome variable in his structural equation model. In a similar manner Ogbonnaya et al. (2017) utilised the same three items of the 2011 WERS to study the effect of contingency pay on employee attitudes, among those employee trust. Innocenti et al. (2011) underline the validity of this measure in their work on the moderating role of trust for the relationship between HRM practices and employee

attitudes, when arguing that the items they used “have proved to be very close in meaning to those adopted by other validated scale, such as WERS” (p. 308). In terms of the reliability of the 2011 WERS to measure the employee trust in managers – the core outcome variable of this PhD research – it can be concluded that, despite a lack of capturing all dimensions of trust, the items present in the WERS bear close methodological fit to the definition of trust in this research and have been validated in previous high-quality empirical work.

The WERS also demonstrates methodological fit in regard to operationalising the other main variable of our model: intra-workplace pay inequality. Although individual income is capped at £27.01 per hour, which understates the reality of top incomes, in the WERS managers have to state how many employees fit in six pay bands. This implies that rather than looking at a *sample* of employees, the pay inequality measure developed from the WERS data is based *on every single* employee of each workplace, meaning that the intra-workplace pay inequality measures are based on the entire population of employees of all workplaces in the sample. Other studies rely on a sample of employees to calculate measures of pay inequality (see Green and Zhou, 2019; Kepes et al., 2009; Martins, 2008; Mueller et al., 2017; Shaw et al., 2002). Whilst having only six pay bands is not as accurate as drawing on administrative data used in some country levels income inequality studies (see for instance Hastings, 2018; Piketty, 2014), the fact that a senior manager, who has access to employee salary data, indicates the pay of all employees in the workplace, constitutes a major improvement to the robustness of the pay inequality measure and hence demonstrates strong measurement validity of intra-workplace pay inequality in the 2011 WERS.

What makes the WERS so valuable as a source of secondary data for the aims of this PhD is the breadth of available information that goes beyond aspects of employment relation such as employee trust in managers and pay, to also include two separate measures of workplace performance. The introduction of Financial Performance Questionnaire since the 2004 WERS, which collected objective account-based measures of workplace performance aspects, addressed previous critique on the value of the subjective measures of relative labour productivity, financial performance and product and service performance (Forth and McNabb, 2004). On the one hand, the availability of both types of performance measures and the previous detailed evaluation of these measures (Forth and McNabb, 2004, 2008; Machin and Stewart, 1990) support the reliability and validity of the operationalisation of workplace performance in this PhD thesis. On the other hand, investigating the relationship between intra-

workplace pay inequality and workplace performance by comparing these two types of workplace performance measures and using pay data of the entire workforce rather than a sample of employees is an important contribution to the existing literature on the relationship.

Next, the WERS is suitable for exploring the role of labour unions and collective bargaining for the relationship between intra-workplace pay inequality and employee trust in managers. The WERS has been extensively used by employment relations scholars to describe developments in and the role of unions representation for workplace outcomes (see for instance Bryson et al., 2006; Charlwood and Terry, 2007) as well as the extent of unions' involvement in pay matters through collective bargaining (see for instance Addison et al., 2013; Brown et al., 2008; Brown and Nash, 2008; Marsden, 2010). The WERS covers unions recognition at the workplace, the level of collective bargaining, the extent of collective bargaining in the workplace and which occupational groups are covered by collective bargaining agreements. Considering the extensive use of the WERS regarding these aspects and one of the WERS specific aims of covering employment relations aspects, the data is arguably reliable and valid in operationalising the role of labour unions for the intra-workplace pay inequality – employee trust in managers relationship.

Last in line of measures are perceived fairness and shared values for research question 2. Each measure will be operationalised by a one item (“Managers at this workplace treat employees fairly”; “I share many of the values of this organisation”) measure. Whilst this one-item measure of perceived fair treatment by managers is not able to capture the underlying aspects of fair treatment – politeness, dignity, respect – that the most established measures of interactional or interpersonal justice do (see Bies and Moag, 1986; Colquitt, 2001), the direct reference to fairness treatment a) encompasses the elements, and b) bear close resemblance to Adams' (1965) conclusion that equity in pay will lead to a feeling of fair treatment by those responsible for the pay, and to the findings of Van den Bos (2005) that the perception of fair procedures will also result in a feeling of being fairly treated. Similarly, the open nature of the one-item measure of shared values focuses on the employee's view on value incongruence “representing the range of beliefs held by its members regarding the set of values that should be the basis for its [the organization's] behaviours and actions” (Bourne and Jenkins, 2013: 502). There is a vast range of organizational values due to the different forms they can take (Badovich and Beatty, 1987; Bourne and Jenkins, 2013). Proposing a limited number of values would thus fall short of capturing the complexity of the construct. This broad measure captures

the essence of the aim of this research: the relationship between intra-workplace pay inequality, fairness perceptions, and shared values as a sign of stratification.

A detailed description of the data source, sample, measures and statistical methods will be found in each empirical chapter.

Moreover, being publicly available, using the WERS in combination with the description of the exact statistical procedures used in this PhD thesis allows for replicability of my findings. Although in “academia the real reward comes not from replication but from originality” (Burawoy, 2003: 650), replication or the ability to replicate findings is important for validation in quantitative research in social science (Bryman 2016; Easterby-Smith et al., 2021).

In sum, the large-scale sample of the WERS ensures external validity in respect to larger workplaces, public access to the data ensures replicability of my findings and the good methodological fit measurement validity. A question remains about the internal validity of the data.

2.2.4 Internal validity: Cross-sectional vs. longitudinal data

Another trade-off using the 2011 WERS lies in its cross-sectional nature. Being interested in the *effect* intra-workplace pay inequality has on employee trust in managers, I am essentially interested in a causal relationship. The problem is that cross-sectional data is based on correlations. Whilst correlations can indicate whether a relationship between two variables exists, it cannot tell us anything about the causal direction because, among others, cause and effect relationships necessitate a difference in time (Berzuini et al., 2012) and cross-sectional data is static (Oberfield, 2014; Strich, 2017). In other words, that fact that intra-workplace pay inequality might explain variation in employee trust in managers in 2011 is not the same as explaining changes in trust over time. One potential remedy to the issue is the use of longitudinal or panel data (Cunningham, 2021). Panel data consists of multiple waves of data from the same set of cases (Singer and Willett, 2003). The WERS does have a panel function, connecting around 900 workplaces and their employees from the 2004 and 2011 WERS. There are, however, at least two issues with the WERS panel option in terms of its ability to support causal inferences: the limited number of waves and the long timespan between the two waves.

In respect to the first issue, there is no consensus on the number of waves in longitudinal research necessary to achieve reliable unbiased results (Strich, 2017), with some arguing that

two-wave designs, which are quite common, are sufficient (Menard, 2002). However, Ployhart and McKenzie (2015) argue that whilst observing how two phenomena change from time 1 to time 2 provides slightly “more insight than a cross-sectional perspective” (p. 88), to capture the evolution and change in organisational phenomena requires more waves. First, two waves make it impossible to show a shape or trajectory of change because the change between the two time periods will always be linear (Chan, 1998; Singer and Willet, 2003), e.g. it increased, decreased or remained the same. In light of the proposed non-linear relationship between intra-workplace pay inequality and employee trust in managers and between intra-workplace pay inequality and employees’ fairness perceptions, which will be presented in the later chapters, a two-waves panel design would be insufficient to test this non-linearity. For this reason, Ployhart and Vandenberg (2010: 97) define longitudinal research in organisation and management studies as containing “at minimum three repeated observations (although more than three is better) on at least one of the substantive constructs of interest”. In other words, the two-wave design of the WERS is unsuited for the aims of the PhD research as a minimum of three waves would be necessary to observe non-linear relationships.

Second, observing a relationship from one time to another time might make it difficult to decide on the direction of causality. Having a higher number of waves gives the opportunity to test whether event A always preceded event B, which will allow to draw more refined conclusions about the direction of the relationship (Granger, 1969). However, even then inferences about causality might be problematic. This leads us to the above-mentioned latter issue of the long lag between the two waves. To draw causal inference from panel data, there should not be any time-variant unobserved heterogeneity (Cunningham, 2021). This means that if there are omitted variables, that is factors unobserved in the data, which are both correlated with the predictor variable and changing over time, then the predictor variable, in this case intra-workplace pay inequality, is endogenous, and results will be biased (Imbens and Rubin, 2015). There are so many time-variant aspects that occurred between 2004 and 2011 that are likely to influence intra-workplace pay inequality, such as the aftermath of the 2007 financial crisis, that cannot be included or observed in the data. In short, the panel option of the WERS does not allow to investigate non-linear relationships, and the long lag between the two waves causes too much endogeneity in the data, which will make it very hard, if not impossible to draw causal inference about the issue under investigation. For this reason, this PhD research only utilised the latest wave in form of the 2011 WERS.

Other longitudinal datasets available for the UK population can deal to a certain extent with the aforementioned limitations of the WERS' two-wave panel structure. Yet, they prove to be inadequate in measuring and analysing intra-workplace pay inequality and employee trust in managers. The *Skills and Employment Survey* (SES) has individual-level panel data on people's working life, such as employees' experiences and aspects of their pay. However, being confined to the individual level, the SES lacks organizational-level data. This is problematic for the aims of this research because employees cannot be linked to their respective workplaces and robust measures of intra-workplace pay inequality, based on the whole workforce, cannot be calculated. In a similar manner, both *Understanding Society* and the *British Cohort Study* are based on decades of yearly waves, which would allow to investigate the non-linearity of the pay inequality – employee trust relationship. However, neither survey has data to adequately operationalise intra-workplace pay inequality or employee trust in managers.

In a nutshell, as with most scientific research, trade-offs have to be made. The 2011 WERS' cross-sectional design does not allow to draw causal inferences regarding the potential relationship between intra-workplace pay inequality and employee trust in managers. Other well-designed representative panel surveys have the potential to remedy this issue. However, to the best of my knowledge, no other secondary representative data set exists with such a high degree of measurement validity.

2.3. Data Analysis: two-fold approach

According to Kozlowski and Klein (2000) the choice of analysis for multilevel research should be based on the “consistency between the type of constructs, the sampling and the data, and the research question; and on the assumptions, strengths, and limitations of the analytic technique” (Kozlowski and Klein, 2000: 51). For the first three research questions, which deal with individual employee trust as an outcome variable, I followed a two-fold statistical approach. First, I used linear multilevel models to take into account the hierarchical nature of the data and added a quadratic term to test for non-linearity. Second, as conventional regression techniques for non-linearity, such as quadratic terms, are less suitable for more complex non-linear relationships, I used random forest models, a class of machine learning algorithms. For the fourth research question on the relationship between intra-workplace pay inequality and workplace performance I used a non-hierarchical weighted linear regression models – least squares for the numerical accounting-based performance measures and logit models for the ordinal perceptual performance measures – and compared the findings to those from random

forest analysis. Justification for the choice of methods in line with Kozlowski and Klein (2000) is provided in the following sub-sections.

2.3.1 Linear multilevel models with quadratic term

As mentioned above in the sub-section on multilevel models, to adequately analyse multilevel data, it is important to use multilevel types of analysis, that is multilevel or hierarchical models. The exact specifications of the models are discussed in each empirical chapter.

Using linear multilevel models to test for potential nonlinearity does however have its drawbacks. Assumptions about the shape of the nonlinear relationship have to be made prior to the analysis. When using polynomial terms to test for U-shaped or inverted U-shape relationships, as I will, the shape needs to be clear-cut to be detected as significant. If this is not the case, important nonlinear relationships might be missed. Machine learning techniques have shown to be much better and predicting nonlinear relationships due to their non-parametric nature (Choudhury et al., 2018; Puranam et al., 2018).

2.3.2 Unpacking complex non-linear relationships through machine learning: random forest models

Machine learning (ML) methods have some advantages over traditional regression techniques. For instance, ML models use cross-validation of the data to avoid false positives (Choudhury et al., 2018), which have shown to be quite common, with Goldfarb and King (2016) estimating that up to 40 per cent of results in statistical strategic management research are false positives. Second, in relation to identifying nonlinear relationships, ML methods show locally sensitive nonlinear effects because they do not a priori assume shapes, breaking or inflection points (Puranam et al., 2018). Third, as ML models are not interested in p-values, but how predictions for a relationship between variables change based on different set of covariates, researchers can focus on the magnitude of effects rather than on the number of asterisks (Choudhury et al., 2018).

In this research I am interested in the relationship between a group of variables – pay inequality, perceived fairness, shared values etc. – and specified an outcome variable, employee trust in managers. In such a predictor-outcome problem, one usually employs supervised machine learning methods (James et al., 2017). For this research I am using one very common supervised ML method: random forest (RF) models (Breiman, 2001). Compared to linear regression techniques, RF models have shown superior performance in predicting an outcome variable. Next to their ability to unpack complex local nonlinear relationships, RF

models have high prediction accuracy, particularly in comparison to traditional linear regression models, whilst they require relatively little tuning (Athey and Imbens, 2019; Mullainathan and Spiess, 2017; Svetnik et al., 2003). RF models have also been shown to be insensitive to irrelevant covariates. Whilst traditional regression models lose power due to overfitting, this will not affect a random forest model (Athey and Imbens, 2019). Although compared to more advanced ML models RF might be more prone to overfitting, this can be remedied through parameter tuning (Choudhury et al., 2018; Puranam et al., 2018). Another important advantage of RF is their relative insensitivity to outliers because they “include nearby point more often than distant points” (Athey and Imbens, 2019: 699). Extreme values will thus end up at smaller, less important part of the decision tree. Moreover, due to RF’s local model fitting, outliers will not affect the model as a whole but they will be averaged locally (Breiman, 2001). A detailed description of the how RF models work will be provided in the methodology section of the empirical chapters.

One common critique of RF models refers to their interpretability. Breiman (2001) one of the pioneers of RF, argued that the increased accuracy comes at a cost of interpretability. However, several techniques have been developed to peek inside this algorithmic “black box”. For instance, Breiman (2001) developed a way to compute variable importance scores for each predictor on an outcome variable from randomized out-of-bag observations. Friedman (2001) developed partial dependence plots (PDP) that can be seen as marginal effect plots for RF models, thus displaying the average predicted local nonlinear effects. The use of such techniques is described in more detail in the methodology section of the empirical chapters.

Chapter 3: The direct relationship between intra-workplace pay inequality and employee trust in managers

To investigate the relationship between intra-workplace pay inequality and employee trust in managers, it is necessary to develop an understanding of what interpersonal trust at the workplace is, how it develops and which factors influence the development. This chapter will thus begin by critically reviewing existing concepts of trust in an effort to develop my own concept that will be used throughout this thesis. The conceptualisation in turn will support the identification of a theory that captures the dynamics that connect intra-workplace pay inequality and employee trust in managers.

With a concept of trust on our minds, in a second step, in this chapter I review the income inequality – trust literature on the macro level, thereby highlighting the contribution of this PhD in exploring how pay inequality affects the trust employees have in their managers at the workplace level.

Having defined trust and identified the need to study the income inequality – trust relationship at the workplace level between employees and managers, I posit the social exchange between employees and managers as the crucial process whereby employees come to judge the trust relationship with their managers in terms of shared values, attitudes, and emotions. It sets out Adams' (1965) theory of *Inequity in Social Exchanges* as the main theory to derive propositions for the association between intra-workplace pay inequality and employee trust in managers, leading to the hypothesised inversely U-shaped relationship. To test this hypothesis, I utilise the 6th wave of the Workplace Employment Relation Study, a large-scale employer-employee matched survey of workplaces in Britain. Results support the hypothesis. Implications for theory, methodology and practice are discussed.

3.1 What is trust? – A conceptualisation of trust as multidimensional psychological state determined by the trust experience

“Trust is an elusive concept, and so no single consensual definition is agreed” (Welter, 2012: 195). The fact that trust is studied across various disciplines ranging from economics and sociology to psychology and neuroscience has not necessarily supported the quest towards a clear common definition (Lyon et al., 2015). Despite these difficulties, there are some commonalities regarding its meaning. In their effort to establish a multidisciplinary view on trust within firms, Rousseau et al. (1998) found that regardless of the field of research, trust is said to have three main components: a) a willingness to be vulnerable to the actions of others;

b) confident or positive expectations about future outcomes, and c) conditions of interdependence between the two trusting parties. Based on these commonly agreed components of trust, Rousseau et al. (1998: 395) define trust as “a perceived psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another”.

Having positive expectations about the actions of the party to be trusted is hence *the* necessary precondition for any trust relationship. If I do not have positive expectations, I will not be willing to make myself vulnerable to the other party. The crucial element, and the focus of this research, is thus to understand how intra-workplace pay inequality affects the positive expectations employees have about their managers. This comes closer to Cummings and Bromiley’s (1996) conceptual and operational definition of interpersonal trust as an individual’s belief that another individual “makes good faith efforts to behave in accordance with any commitments ..., is honest, and does not take excessive advantage of another even when the opportunity is available” (p. 303).

With the aim of studying employee trust in managers, I essentially consider two different, though related and reinforcing forms of trust (Den Hartog, 2003; Mayer et al., 1995; Mcknight et al., 1998). On the one hand, trust in managers is an interpersonal form of trust between two individuals who are in direct contact, such as the employee and her line manager. On the other hand, the term manager can also be regarded as a synonym for the organisation or the general management of the firm. When one talks about employee trust in managers in such cases, organisational trust – the trust of individuals in relation to their institutional environment (Tan and Tan, 2000) – is more appropriate.

Although Rousseau et al.’s (1998) and Cumming and Bromiley’s (1996) definitions above refer to interpersonal trust in co-workers or in supervisors, here it will also be used for trust in management. Trust in management includes not only the positive expectation that management behaves with good intentions toward the employee but also an element of vulnerability in that management is the party shaping rules and structure of the organisation (Cho and Park, 2011).

Having established that trust has three components, the next step is to conceptualise trust, that is, to capture the nature of this phenomenon of everyday life. In some cases, trust is said to be a trait (Khalil, 2003; Mayer et al., 1995), in others an attitude (Lahno, 2001; Whitener et al., 1998) and again in others, particularly in economics, trust is treated as a choice or decision (Glaeser et al., 2000; Poundstone, 1993). Here, in line with Rousseau et al.’s (1998) definition,

I will adopt the concept of trust as a *psychological state* (Kramer and Lewicki, 2010; Lewicki and Bunker, 1996; Lewis and Weigert, 1985; McAllister, 1995). This approach also matches well with Cumming and Bromiley’s (1996) definition of trust as a belief, which is by definition a mental state (Schwitzgebel, 2019).

3.3.1 Multi-dimensional models of trust

Most scholars adopting a multi-dimensional view of trust distinguish between different types or stages of trust. In his study on interpersonal trust between pairs of 194 managers and professionals, McAllister (1995) found that there are essentially two different forms of trust in interpersonal relationships: cognition- and affective-based trust. While the former is grounded in rational decisions stemming from observed or perceived knowledge about the other person’s trustworthiness, the latter depends on the emotional aspects of the trust relationship, such as genuine care and concern for the other person. Although affective trust can be seen as a higher level of trust resulting from cognition-based trust, each form “functions in a unique manner and pattern of association to antecedent and consequent variables” (McAllister, 1995 p. 51). Together these two then constitute an overall form of trust (Dirks and Ferrin, 2002).

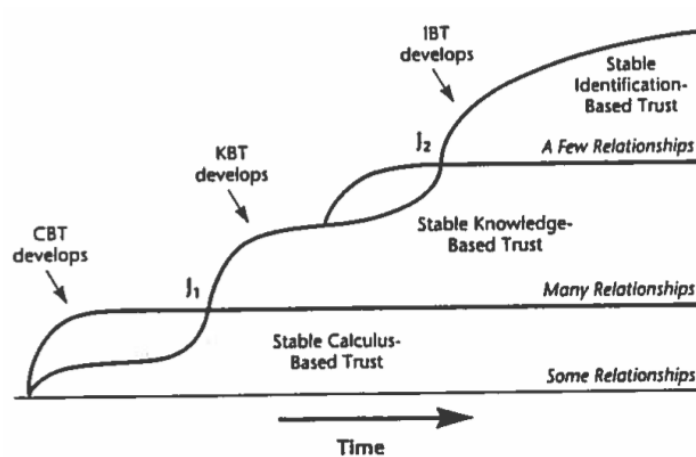
Keeping the concept of trust as having both cognitive and affective dimensions, Shapiro et al. (1992), Lewicki and Bunker (1995, 1996) and Rousseau et al. (1998) conceptualise trust in different transformational models to capture the dynamics of trust relationships. The former two teams of authors model trust in three stages, representing three distinct forms of trust (see figure 1 and 2 below).

Figure 1: Stages of trust development - Shapiro et al. (1992)

Deterrence-Based Trust
Knowledge-Based Trust
Identification-Based Trust

Source: Shapiro et al. (1992)

Figure 2: Stages of trust development – Lewicki and Bunker (1995, 1996)



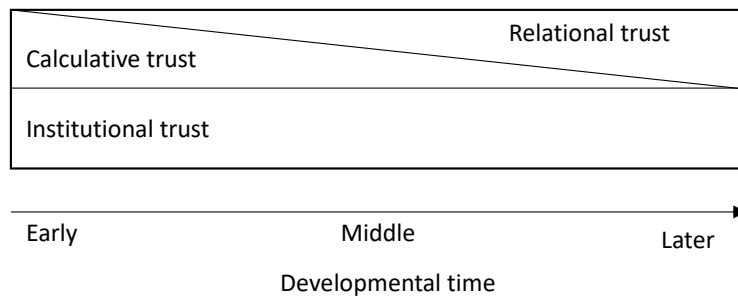
Source: Lewicki and Bunker (1995)

Although naming it differently – Shapiro et al. (1992) call it deterrence-based trust, whilst Lewicki and Bunker refer to it as calculus-based trust – both models treat the first stage of trust as cognition-based. The person to trust - from here on referred to as ‘trustor’ – judges whether to enter a trust relationship with the person to be trusted – i.e., the ‘trustee’ – based on a cost-benefit analysis. Such an analysis considers the possible repercussions, that is, the costs of violating the other party’s trust, in relation to the gains from the relationship. Over time and through repeated successful interaction, this form of trust can develop into knowledge-based trust. As the word knowledge implies, trust in the trustee is based on the ability to predict the other’s behaviour based on past information (Lewicki and Bunker, 1995, 1996; Shapiro et al., 1992). To this point, trust is a purely rational choice based on a perceived cost-benefit analysis and the evaluation of past behaviour. The final stage, or the highest form of trust in both models is labelled identification-based trust. For Shapiro et al. (1992) this means that both parties fully internalise the other party’s preferences. Lewicki and Bunker (1995, 1996) rather view this stage as identifying oneself with the intentions of the other through the development of a mutual understanding. It is only during this last stage, where both parties have entered a rather close relationship based on shared preferences, values and intentions that entails affective dimensions.

Rousseau et al.’s (1998) model slightly differs from the above. First, the authors merge the first two states of trust from the previous models but keep the term calculus-based trust. In their model, calculus-based trust is derived from both deterrence and from knowledge about intentions and competence of the trustee. Through repeated interaction over time relational

trust develops. It is this stage of trust in which emotions enter the picture and in which attachments between people are formed. Within an organisation, citizenship behaviour of employees can be a sign of this form of trust (ibid.). Second, Rousseau et al. (1998) do not view calculus-based and relational trust as separate stages. Instead, the two forms co-evolve, so that while relational trust increases, calculus-based trust decreases proportionally (see figure 3). Finally, the authors argue that “trust may be a ‘meso’ concept, integrating microlevel psychological processes ... with macrolevel institutional arrangement” (p. 395). It is hence the underlying institutional settings that accompany and influence the development of trust.

Figure 3: A model of trust – Rousseau, Sitkin, Burt, Camerer (1998)



Source: Rousseau et al. (1998)

All three models are valuable in the sense that they illustrate that trust is an on-going process, that takes different forms – cognitive and affective – and that can have different scopes, which depend on the attitudes and feelings people have to one another. Nevertheless, two issues are inherent in all of them. First, except for the one by Lewicki and Bunker (1995), all models show a linear development of trust. However, explorative longitudinal work found that trust and its development “seem to include various cycles and spirals instead of a distinct ‘linear’” progress in stages (Ikonen, 2012). Considering this, one has to be cautious to think of trust in these very discrete hierarchical stages. Second, and more importantly, the models draw a clear line between the cognitive and affective forms of trust. Only Rousseau et al. (1998), by viewing the two forms of trust as co-evolving, recognise that affective elements might play a role, though this role is gradually increasing with time and interaction, and limited to the affective notion of trust. As such, neither of the above-mentioned authors perceives non-rational elements to be crucial for *all* forms of trust but only for high, affective forms.

3.3.2 *Trust as emotion*

In his philosophical essay, Lahno (2001: 185) argues that trust is an emotional attitude “beyond the direct control of reason and cannot be understood as the result of rational calculation”. From this, he argues, it follows that any form of trust based on rational decisions cannot be considered trust at all. Therefore, one needs to define trust and reliance as two distinctly different concepts. Whilst trust is emotionally laden, reliance is of non-emotional or rational nature. Comparing this argument to the models of trust above, one notices that the authors are essentially agreeing with one another. The only difference lies in their definition of trust. Lahno (2001) distinguishes trust from reliance, whereas the above-mentioned authors view the latter as cognitive-, calculus-, deterrence- and knowledge-based forms of trust. Similarly, Lahno’s (2001) argument that trust is also determined by how motives and interests of the other party align to one’s own, sounds similar to the definitions of affective-, identification- and relational trust mentioned before.

Whilst I acknowledge and appreciate Lahno’s effort to distinguish between the two concepts of trust and reliance, I will continue to treat reliance here as a lower form of trust for two reasons. First of all, the scope of this research is limited to trust in organisational settings, particularly to relationships between employees and their managers. Such relationships are distinctly different from general personal relationships outside the workplace whereon Lahno (2001) focuses. More importantly, the presented definition of trust only mentions the expectations about performing an action that is important to the trustor. An employee relying on his or her manager to, for instance, always give sufficient notice about upcoming deadlines, would fit that description. Contrary, an individual could not say that she *trusts* another person just because she can always rely on the other one telling her the exact time when being asked.

Notwithstanding the established similarity to the other transformational models, Lahno’s (2001) emphasis on emotions constitutes a fresh and crucial addition to the understanding of trust. Starting off with Aristotle’s definition of emotions as “all those feelings that so change men as to affect their judgements, and that are also attempted by pain or pleasure” (Aristotle, 1984 in Lahno, 2001: 175), Lahno lists three ways in which emotions shape our cognition:

“1. Emotions determine how we perceive the world in a direct manner. They do so by giving us a certain perspective on the world. They guide our attention by making some things appear more salient than others.”

2. Emotions determine how we think and what judgements we make on matters of fact. That is not to say that an emotion necessarily annuls suggesting certain patterns of interpretation. Instead it redirects reason by stimulating certain associations and suggesting certain patterns of interpretation.

3. Emotions guide our evaluation of some aspects of the world and motivate our actions.”

(Lahno, 2001: 175).

Even though the author used these qualities of emotions to argue that trust itself is an emotion that changes how we view our relationships with others, the central message here is that emotions influence our perceptions, judgements and evaluations. His argument is in line with research in cognitive psychology which shows that emotions shape behaviour (Ben-Ze'ev, 2000; Hammond and Drummond, 2019) and influence decision-making (Carnevale and Isen, 1986; Grecucci et al., 2020; Isen et al., 1978; Pessoa et al., 2019).

Ultimately, this would imply that even trust that is rational- or cognition-based has an affective component in so far as perceptions about and knowledge of the trustee are influenced by a person's emotions. This is the same conclusion that both Lewis and Weigert (1985) and Williams (2001) reach. The former scholars argue that emotions experienced in a trust relationship are likely to influence “the cognitive ‘platform’ ... from which trust is established and sustained” (Lewis and Weigert, 1985: 971). Williams agrees with this and concludes that “potential influences of affect on more ‘shallow’, cognitively based types of trust are often ignored. However, to the degree that affect influences judgements, motives, and thought processes, it may actually influence all stages and types of trust” (p. 379). With this in mind, it follows that trust can take different forms, both cognitive and affective, and that these forms constitute different stages of trust, but that it would be careless to neglect the potential influences of affect or emotion on aspects of cognition. Williams refers to the work of Jones and George (1998) as an exception to the neglect of this aspect of trust.

3.3.3 Values, attitudes, moods and emotions

Jones and George (1998) bring together the two aforementioned strands of trust concepts. However, “rather than asserting that different determinants lead to different types of trust” as Lewicki and Bunker (1996), Shapiro et al., (1992) and Rousseau et al. (1998) do, Jones and

George (1998: 537, italics added) “conceptualize trust as a changing and evolving experience, in which values, attitudes, moods and emotions operate *simultaneously* to produce an overall state of trust or distrust”.

For Jones and George (1998) what really matters for any trust relationship is the trust *experience*. And since the trust experience is shaped by the interplay of values, attitudes, moods and emotions, these factors are not exclusively confined to higher forms of trust but present in *all* states or stages. Values, which they define as intrinsically desired principles, provide a ‘standard of trust’ people want to achieve in their relationship. Attitudes, defined as “the knowledge structures containing the specific thoughts and feelings people have about other people, groups, or organizations” (Jones and George, 1998: 532), inform the trustor about the trustee’s trustworthiness by evaluating past interactions with and knowledge about the other party. Lastly, “intense affective states that interrupt ongoing cognitive processes” (p. 533), or, more simply, emotions, act as signals of the quality of the trust relationship.

Next to having their own distinct role in the development and experience of trust, these three phenomena interact with one another. Values can be seen as a compass which gives our evaluation of others, in this case our attitudes, direction. Attitudes about others can put one in a positive or negative mood depending on our evaluation of the other party. Conversely, over time a continuous negative mood can turn into a more negative attitude towards another party, which, according to Jones and George (1998), can induce a change in the perception of shared values.

In line with the other multi-dimensional models of trust, Jones and George (1998) identify three distinct states of the trust experience: distrust, conditional trust and unconditional trust. Here, conditional trust resembles knowledge-based trust and unconditional trust identification-based trust. Yet, contrary to the other models, the three states are part of the same construct rather than each constituting their own separate construct linked to their own distinct determinants.

Whereas in the other models, values, feelings and emotions only enter the picture at the highest stage of trust, in Jones and George’s (1998) model, values, attitudes and moods and emotions interact with one another to determine if one trusts or distrusts the other party and if one trusts conditionally or unconditionally. This is because a perceived value congruence is the starting point and building block for *any* trust relationship. When one perceives a value incongruence, initial trust can quickly turn to distrust. This claim is supported by empirical

evidence which shows that values in general (Fukuyama, 1995; Hardin, 2006; Mayer et al., 1995), and in particular those in regard to justice and fairness are important antecedents of trust (Alexander and Ruderman, 1987; Choi, 2011; Cohen-Charash and Spector, 2001; Colquitt et al., 2001; DeConinck, 2010).

Beyond this first stage, the future trust experience is shaped by the behavioural interactions and encounters in the exchange relationship with the other party. It is here where values, attitudes, moods and emotions come into play. The psychological experience of the exchange with the other party is evaluated and evolves through the development of attitudes to the other party. Employee attitudes such as satisfaction with (Cho and Park, 2011; Dirks and Ferrin, 2002) or commitment to (Albrecht and Travaglione, 2003; Ayree et al., 2002; Coyle-Shapiro et al., 2002; Dirks and Ferrin, 2001) their managers or the organisation have been repeatedly positively linked to employee trust.

Every point of exchange offers the possibility for moods and emotions to enter the picture to give instantaneous feedback about the other party. Positive moods and emotions from the exchange give further assurance about the general or overall feeling, e.g. the attitude, about the trust relationship, thus increasing trust, whilst negative emotions indicate a negative evaluation of the exchange, thus signalling less trust (for empirical evidence see Dunn et al., 2012; Dunn and Schweitzer, 2005).

3.3.4 Conceptualization of trust in this research

In conclusion, based on the before-mentioned literature, I conceptualise trust as an on-going and changing psychological state that includes both cognitive and affective dimensions (Lewicki and Bunker, 1995; McAllister, 1995; Rousseau et al., 1998; Shapiro et al., 1992). The prominence of affective and cognitive dimensions depends on the state of the trust relationship, which can range from simple reliance regarding specific tasks to a level where the trustor has unconditional trust in the trustee (Jones and George, 1998). Developing higher levels of trust depends on the trust experience which is determined by the values, attitudes, and moods and emotions towards the trustee that are elicited from and evolve through repeated behavioural exchanges between two parties (Jones and George, 1998). Both more shallow forms of trust that predominantly fall in the cognitive dimension and higher forms of trust in more affective dimensions are influenced by affective elements such as emotions (Dunn and Schweitzer, 2005; Dunn et al., 2012), attitudes (Albrecht and Travaglione, 2003; Ayree et al., 2002; Coyle-

Shapiro et al., 2002; Dirks and Ferrin, 2001) and shared values (Fukuyama, 1995; Hardin, 2006; Mayer et al., 1995).

On the one hand, shared values have been described as the foundation for any high-quality trust relationship, thus giving prominence to the idea that familiarity in terms of values could be the link between pay inequality and trust. On the other hand, seeing trust as this psychological state that is influenced by attitudes, moods and emotions towards the trustee indicates that perceptions of the trustee are important. These perceptions are based on an exchange between the two parties, which is evaluated by the aforementioned values, attitudes, moods and emotions. A positive exchange between two parties also relates to a balance of giving and receiving (Adams, 1965), which gives rise to the idea of work effort on the side of the employee and pay and other aspects on the side of managers. As such building a bridge to the potential role of pay inequality.

Relating this concept of trust to the aim of understanding the relationship between intra-workplace pay inequality and employee trust in managers poses two questions. First, if the exchange relationship between employees and managers is important to judge the trust experience, what is the role of income inequality in this exchange? Second, how do values, attitudes and moods and emotions, which indicate the employee trustworthy behaviour, enter the picture and relate to pay inequality? Before I venture into these questions on the workplace level, the following sub-chapters will critically review the relationship between income inequality and trust on the macro level.

3.2 Income inequality and trust in others

Declining levels of trust on the country level (Edelman, 2020; Ortiz-Ospina, 2016; Uslaner, 2000) have been linked to increasing levels of income inequality. Income inequality, defined as the disparity between different individuals' or households' income in a particular year (OECD, 2021), where income includes earnings from wage-employment, self-employment and capital income, is at its highest level in many OECD countries since its recording began (OECD, 2015).

Since the 1990s, empirical cross-country studies have repeatedly shown a negative relationship between income inequality and trust in others (Delhey and Newton, 2003, 2005; Elgar, 2010; Elgar and Aitken, 2010; Fairbrother and Martin, 2013; Kawachi et al., 1997; Knack and Keefer, 1997; Leigh, 2006b; Uslaner and Brown, 2005; Wilkinson and Pickett, 2011; Zak and Knack, 1998). An exception to this negative relationship was found by Steijn

and Lancee (2011). After controlling for the general wealth of a country, the effect of income inequality on trust turned non-significant. Yet, this was only found when excluding high-inequality countries from the sample.

Whilst the cross-sectional evidence for the relationship between income inequality and trust is quite compelling, drawing any inferences about causality becomes difficult, if not impossible (Cunningham, 2021). As a corollary, several more recent studies have used longitudinal data. In their time-series research on income inequality and happiness in the USA, Oishi et al. (2011) concluded that “this inverse relation between income inequality and happiness was explained by perceived fairness and general trust” (p. 1095). This means, in years where income inequality was higher Americans trusted each other less and perceived the situation to be less fair. Similarly, Hastings (2018) found that increases in inequality in the USA were associated with decreasing levels of trust; yet the results are sensitive to how time is included in the model. The fact that both studies used the same data source for trust, the General Social Survey, but that Hastings (2018) used tax returns to calculate income inequality – a much more accurate method as more high-income earners are included (Piketty, 2014) – further strengthens the established relationship between income inequality and trust.

In his extensive research on the stark developments in social trust in the US, UK, Sweden and Denmark, Larsen (2013) finds case study evidence for a more generalizable trend between income inequality and trust. On the one hand, income inequality has grown, and trust declined in the US and the UK. On the other hand, the opposite has occurred in Sweden and Denmark. Although being mainly interested in the relationship between life satisfaction inequality and trust in society, Graafland and Lous (2019) in their panel analysis of 25 OECD countries between 1990 and 2014 detected that “income inequality increases life satisfaction inequality and that both income inequality and life satisfaction inequality have a significant negative effect on social trust” (p. 1817). In line with these results, longitudinal evidence across countries using the World Value Survey 1981-2008 suggests that in countries where income inequality increased generalized trust decreased (Fairbrother, 2014). Last in the group of panel data is the work by Barone and Mocetti (2016). Testing not only the relationship between the Gini coefficient and trust, as almost all previous studies have done, but also including the income share of the top 10 per cent and top 1 per cent as well as testing for the effect of intergenerational mobility, the scholars find that regardless of the measure of inequality, increases in income inequality were associated with decreases in trust in developed countries. Complementing this vast amount of country level studies, experimental evidence on the

dynamic interplay between income inequality and trust found that trust is higher when endowments in experimental trust games are more equal (Greiner et al., 2012).

Organisational research has studied the relationship between pay inequality levels and employee attitudinal outcomes such as satisfaction and commitment (Breza et al., 2018; Card et al., 2012; Green and Zhou, 2019; Song and Whang, 2020) as well as employee productivity (Kepes et al., 2009). The question when pay inequality is perceived as positive and when as negative was central to the strand of research. Other scholars have discovered a consistent relationship between organizational justice perceptions – distributive, procedural and interactional – and employee trust in superiors and the general management (see for instance Ayree et al., 2002; Colquitt et al., 2001; Dirks and Ferrin, 2001). Tjosvold (1982, 1985) and Ferrin and Dirks (2003) found experimental evidence that cooperative reward structures, which they define as those which are purely based on joint performance, increase interpersonal trust between participants. Yet, to my knowledge, the link between actual intra-workplace pay inequality and employee trust has not been investigated to this day. This is lent further support by Bapuji (2015), who identified the effect of resource and reward dispersion on individuals within organisations, and on the interaction among individuals in organisations as underexplored relationships in organisational studies.

Considering this evidence, it can be concluded that there seems to be a) robust evidence for a link between income inequality and trust on the country level, and b) a link between inequality and generalized trust, that is trust one does not have a personal relationship with. Yet, what seems to be missing in this body of research is the relationship between income inequality and trust in organisations, on the one hand, and an exploration of the relationship between inequality and trust one has a personal relationship with, on the other. Put differently, is there a relationship between intra-organisational pay inequality and trust in for instance co-workers or managers?

3.3 Intra-workplace pay inequality and employee trust in managers

One of the reasons for the aforementioned increase in income inequality is the change in the distribution of wages, that is, income from labour rather than from capital gains. Whilst the top 10 per cent of wage earners saw their pay grow, those in the bottom 10 per cent witnessed their share declining (Atkinson, 2015; Piketty, 2014; Stiglitz, 2015). Several studies found that the increase in wage inequality stems from significant growth in earning inequality both between

and within organizations (Barth et al., 2014; Card et al., 2013; Song et al., 2019). Card et al. (2013), studying the case of West Germany, find that 40 per cent of the rising wage inequality is attributable to person-specific factors, whilst 25 per cent can be attributable to the workplace. The remaining 35 per cent of the rise in wage variance can be attributed to the covariance, that is the joint variability/effect of person- and workplace-specific factors. For the US, Barth et al.'s (2014) results show that the majority of growth in wage inequality in the USA between 1970s and 2010s is a consequence of the increasing inequality of wages among organisations where people work, thus highlighting the crucial role of workplace-level pay setting. In a recent article on the topic, Song et al. (2019) are able to quantify the share of inequality growth attributable to within-firm inequality and between-firm inequality, as one-third, and two-third, respectively. This implies that a) the distribution of wages within firms has become more unequal, and b) workers are increasingly separated in high-wage and low-wage workplaces, with high-wage earners benefitted disproportionately.

The workplace more than the organisation as a whole is arguably well suited when attempting to understand the dynamics of the relationship. The workplace is an environment that provides people with information about differences in pay and potentially information on the reason for these pay differences (Greenberg et al., 2007). Considering that disparities in pay between lower- and higher-educated workers has increased significantly, it is crucial to investigate whether this “meritocratic extremism” (Piketty, 2014) is perceived as negative, positive or whether the picture might be more complex. Studying this phenomenon at the workplace level can offer better insights into these questions because employees are able to observe their peers (Greenberg et al., 2007) as opposed to social trust on the country level which focuses on strangers. Furthermore, due to the growing disparity in pay not only within but also between workplaces (Barth et al., 2014), an analysis at the workplace level is advantageous in comparing the result of these different approaches to management pay dispersion for trust in those who are responsible, namely the *managers* (Brown et al., 2001; Bebhuck and Fried, 2003). Spending a significant amount of time of their lives at their respective workplaces, employees’ views and perceptions about the distribution of pay that are developed in the workplace might also be used to make judgments about inequality in society at large, thus potentially influencing how income inequality is being viewed in general. According to Bapuji (2015), on the one hand, income inequality affects workplaces indirectly due to lower human development and directly “by influencing the attitudes and behaviours of individuals, by affecting their interactions in the workplace and by shaping an organization’s

institutional environment” (p. 1060). Though, on the other hand, workplace-level pay inequality might also influence people’s attitudes to macro-level income inequality because “...business organizations are at the core of economic inequalities given their preeminent position as the economic agents that create and distribute value” (Bapuji, 2015: 1060). The focus on trust in managers is important in two ways. First, managers are responsible for setting their own and employees’ pay (Brown et al., 2001; Bebhuck and Fried, 2003). And second, it is employee trust in managers or management that is likely to lead to important positive employee and workplace outcomes, something of interest not only to research but to practitioners as well.

Employee trust in supervisors and management is associated with innovation (Abrams et al., 2003; Clegg et al., 2002; Dovey, 2009; Nooteboom, 2013). Trust in management and supervisors has also been linked to higher levels of employee satisfaction (Ayree et al., 2002; Braun et al., 2013; Cho and Park, 2011; Dirks and Ferrin, 2001, 2002; Gill, 2008; Matzler and Renzl, 2006; Thoms et al., 2002; Timming, 2012; Top et al., 2015), organisational commitment (Albrecht and Travaglione, 2003; Ayree et al., 2002; Coyle-Shapiro et al., 2002; Cullen et al., 2000; Innocenti et al., 2011; Timming, 2012; Top et al., 2015) and organisational citizenship behaviour (Colquitt et al., 2007; Dirks and Ferrin, 2002). In light of these positive consequences of trust on employee level outcomes, scholars hypothesised and found a positive relationship between trust and individual level performance (Colquitt et al., 2007; Dirks and Ferrin, 2002; Sharkie, 2009) and organisational performance (Brown et al., 2015; Dirks, 2000; Tzafrir, 2005).

Returning to the conceptualisation of trust, past empirical literature raises important questions for the relationship between intra-workplace pay inequality and employee trust in managers. First, if the exchange relationship between employees and managers is important to judge the trust experience, what is the role of income inequality in this exchange? Second, how do values, attitudes and moods and emotions, which indicate the employee trustworthy behaviour, enter the picture and relate to pay inequality?

3.4 Social exchange theory, trust and inequality

To answer the aforementioned questions, this section critically reflects on two well-established social exchange theories. First, Peter Blau’s (1964) social exchange theory, which has been used quite frequently in trust research, is analysed in regard to pay inequality. However, next to characterising pay as part of the economic rather than the social exchange, Blau only briefly touches upon the specific social exchanges between employees and their employers or

managers and on the role of fairness in and reactions to social exchanges in the workplace. Second, John Stacy Adams' (1965) equity theory, does exclusively focus on the role of fairness in the social exchange between employees and their employer and to the affective reactions to violations of the equity principle. Whilst not directly referring to or mentioning trust, Adams' discussion of fairness, satisfaction and anger relates extremely well to the established factors of the trust experience: values, attitudes and emotions. Implications from his theory are drawn to hypothesise a non-linear, inversely U-shaped relationship between intra-workplace pay inequality and employee trust in managers.

3.4.1 Blau's link between trust and social exchanges

Considering the crucial role of the exchange between two parties for a trust relationship, it might not be surprising that one large strand of the trust literature has used social exchange theory as theoretical foundation (Nienaber et al., 2015). Among the most widely used types of social exchange theory in this context is the one developed by Peter Blau (1964).

Blau makes a distinction between economic and social exchanges. Whilst the former entails specific obligations for each of the two parties in the exchange – which are stated in a formal contract “that stipulates the exact quantities to be exchanged” (Blau, 1964: 93) – social exchanges are rooted in unspecified obligations, i.e. those that are not a priori or contractually defined. Blau further argues that “since there is no way to assure an appropriate return for a favour, social exchange requires trusting others to discharge their obligations” (Blau, 1964: 4). The reciprocal nature of trust, exercised through repeated exchanges of favours, is thus at the centre of any *social* exchange. Social exchanges are described as slow processes that need to evolve from little favours that require low levels of trust, to more important favours that require more trust. Since economic exchanges are based on clearly stipulated obligations, only social exchanges with their inherent uncertainty of reciprocity include, according to Blau, aspects of trust.

Although Blau's theoretical work on social exchanges captures both the reciprocal element of and the inherent vulnerability in trust, it fails to capture some aspects important to the aim of this study. First, as he discusses social exchanges in general, a detailed analysis of social exchanges within organisations, and specifically between employees and their managers, is missing. For Blau, the exchange relationship between employees and their managers would, in regard to pay, be an economic one. The pay and other benefits an employee receives for a particular set of services are stipulated in a formal employment contract. The employee does her work and the management will pay her the amount as stipulated in the contract. Yet, as

Whitener et al. (1998: 515) argue “although the formal or contractual relationship in employment is economically driven, a social element to such relationships typically evolves”. I will go further and, in line with Adams (1965), argue that the relationship between employees and managers does not *include* a social element, it *constitutes* a social exchange in itself, in that, despite being stipulated in a formal contract, there are unspecified obligations and expectations on each side. For instance, a manager might demand employee loyalty, a willingness to work beyond the limits stipulated in the contract or the employee’s personal engagement with the company culture, whilst employees might expect from their managers to be treated with respect, show understanding for private matters the employee faces outside the workplace and or having a mentor rather than a manager. Second, whilst Blau briefly refers to fairness in and affective reactions to social exchanges at work (see Blau, 1964: 158-9), he does not develop a detailed account of these phenomena. Yet, it is this aspect of the perception of the social exchange and the resulting moods and emotions that, as we have seen above, is so vital for a developing trust relationship.

John Stacy Adams’ (1965) theory of “Inequity in Social Exchanges” fills this gap by focusing exclusively on perceived fairness in the exchange relationship between employee and employer from the employee perspective and what kind of affective reaction unfairness, or how he terms it, inequity may trigger. Although, in contrast to Blau, Adams does not make any inferences about trust, his focus on *perceived* inequity, dissatisfaction and emotions connects very closely to the aforementioned conceptualisation of trust in this thesis, which highlighted shared values, attitudes, moods and emotions as elements that structure the trust experience, and to the inequality perception effect mentioned in the income inequality – trust literature. The next section will therefore first introduce Adams’ equity theory and then draw implications from the original theory for the role of intra-workplace pay inequality in employee trust in managers.

3.4.2. Adams’ Equity Theory

In his theoretical work, Adams (1965) postulates that in the exchange between employee and employer, which he categorises as a social exchange, a balance has to be established between the employee’s inputs, e.g. her education, training, experience, skills, effort etc., and the outcomes offered to her by the employer, e.g. her pay, fringe benefits, seniority benefits, and other work-related rewards. Only if the employee perceives the social exchange as just or equitable, will she feel fairly treated and as a result be satisfied. Since outcomes should match

inputs, it follows that a general level of pay inequality is inevitable due to the differences in employees' inputs, such as their educational level, experience and responsibility. It is hence not inequality *per se* that is important to the employee but the *perceived* fairness in the social exchange that is determined through meritocratic fairness principles.

Even though inputs and outcomes are conceptually distinct from one another, they are, albeit imperfectly, correlated. It is exactly this imperfection, so argues Adams (1963, 1965), that ultimately gives rise to inequity. Although not giving any reference, Adams points out that there are some normative expectations in society in respect to what constitutes a fair relationship between inputs and outcomes. Such expectations are developed and formed through a "process of socialization" (Adams, 1965: 279) referring to situations at home, in an education environment and at the workplace (Adams, 1963, 1965). Expectations are, according to Adams (1965: 279; 1963: 424), "based by observation of the correlations obtaining for a reference person or group – a co-worker or a colleague, a relative or neighbour, a group of co-workers, a craft group, an industry-wide pattern". This statement implies two important things. First, an individual's perception of what should be a fair ratio between one's inputs and outcomes is developed through comparison processes with referent persons or groups. Second, these comparison processes can either happen internally, e.g. with people in the same workplace, or externally, e.g. with people or groups outside the workplace. Referring to Festinger's (1954) social comparison theory as well as to work by Hyman (1942), Merton and Kitt (1950) and Patchen (1961), Adams assumes that referents are selected based on at least one comparable attribute, implying that people seek comparisons with those who are similar. He goes further to argue that employees only seek comparisons with co-workers, and even if they compared their pay to that of their supervisors, they would not feel any inequity because higher pay of supervisors is always matched by higher inputs.

To exemplify his theory, Adams defines any individual that can experience both equity or inequity as 'Person' and the individual or group used as referent as 'Other'. It follows that, "inequity exists for Person whenever his perceived job inputs and/or outcomes stand psychologically in an obverse relation to what he perceived are the inputs and/or outcomes of Other" (Adams, 1963: 424). Inequity, thus, exists for Person not only when one feels undercompensated but naturally also when one feels overcompensated. Though, the feeling of being unfairly treated from overcompensation is triggered at a later threshold (Adams, 1963, 1965). Crucially, the value attached to inputs and outcomes are based on individual perceptions and can thus vary among people.

The second important contribution of Adams' theory lies in its analysis of the emergence and implications of the state of inequity. According to Adams (1965), it is quite logical that inequity will result in an unpleasant emotional state that can cause either a feeling of anger for those feeling disadvantaged, or of guilt in case of those that experience inequity from a beneficial position. In line with Festinger's (1957) cognitive dissonance theory, he argues that inequity results in tension proportional to the magnitude of the felt inequity. The inner tension in turn triggers a motivation to decrease inequity, which is proportional to the felt tension (Adams, 1965). This can either mean that employees reduce their inputs, mostly work effort, to restore the adequate balance between outcomes and inputs. Or employees might engage in sabotaging behaviour towards those who a) unjustly receive higher outcomes than they deserve, or b) are responsible for the distribution of outcomes.

3.5 Implications for this research

Taken in its original form, we can derive several implications from equity theory for the relationship between intra-workplace pay inequality and employee trust in managers. Although Adams talks about the exchange between employees and employers, today we would rather attribute this to the relationship between employees and their managers, which are the focus of this study. Managers act on behalf of the employing organisation to deal with the formation and maintenance of contracts, allocating resources, negotiating with employees (Stewart, 1998; Zaleznik, 2004) as well as allocating and rewarding employee positions (Buckingham, 2005). In most cases, intra-workplace pay is being determined and managed by local managers in decentralised pay-setting (Brown et al., 2003).

First, and most importantly, differences in pay are important for distributive fairness perceptions in that they reflect or better should reflect differences in employees' inputs. Following this argument, employees do not have a problem with others earning more than them, if they have, for instance, enjoyed a better education, bring experience to their job and demonstrate a high degree of effort. In short, some degree of inequality should be perceived as fair, resulting in positive attitudes, moods and emotions directed at those responsible, that is the managers. These positive attitudes, moods and emotions in turn positively influence the trust experience between the employee and her managers (Jones and George, 1998). Contrary to the macroeconomic level, pay inequality thus does not necessarily have to result in negative outcomes, but certain levels can actually be perceived as positive, and thus trust enhancing if pay differences are based on principles of fairness.

Pay inequality is, however, a problem for an employee, if others enjoy outcomes which do not match their perceived inputs. In these instances, the employee perceives the level of pay inequality to be unfair. The person to be blamed for this unfairness is the manager who should establish a fair distribution of pay within the workplace to maintain equity in the social exchange. If they fail to do so, the employee will feel unfairly treated, resulting in negative moods and emotions directed at those responsible for the inequity. Since the trust experience is influenced by moods and emotions, these negative moods and emotions will result in negative perceptions of the social exchange in turn signal the employee untrustworthy behaviour of managers (Jones and George, 1998).

The effect of pay inequality on employee trust in managers is thus best depicted by an inverted U-shape. Inequality can be perceived as positive and motivating resulting in more trust as long as more effort, education etc. are perceived to be rewarded with higher pay. Yet, when there are outcome differences that are perceived to not represent input differentials, inequality is seen as unfair. This unfairness and the resulting negative attitudes and emotions will influence the trust experience negatively. This chimes with country level evidence on the relationship between pay inequality and happiness (Oishi et al., 2011; Yu and Wang, 2017). Oishi et al.'s (2011) study demonstrated that the negative association between income inequality and happiness was explained by lower levels of fairness and trust in years with higher levels of income inequality. Yu and Wang (2017) also used the perception of fairness, elicited through social comparisons, as theoretical underpinning to argue that the relationship between income inequality and happiness should be inversely U-shaped. In line with their prediction that at very low levels of inequality, increases in inequality can be seen as motivational, and at high levels of inequality, further increases but be perceived as negative, the authors found a curvilinear relationship.

Adams argues that it is not about the objective ratio between inputs and outcomes, but those based on individual perceptions. In other words, do people in workplaces where inequality passes this threshold that separates fair from unfair pay inequality, perceive the inequality as unfair? Considering the vast increases in pay inequality in combination with the decoupling of productivity and real wages of the average worker (Piketty, 2014), it seems likely that employees in workplaces where this is the case, perceive this to be unfair.

In a nutshell, according to equity theory, higher pay inequality is likely to affect employee trust in managers through perceptions of (un-)fairness and the resulting attitudes, moods and emotions. Intra-workplace pay inequality might only result in a negatively perceived social

exchange relationship and as a result lower trust in managers, if workers with similar inputs in similar positions perceive to receive different outcomes. Although Adams argues that the higher outcomes of managers/supervisors are always matched by their higher inputs, if the difference in pay passes a threshold that people perceive as unjustified, subjective disparity, from a strict equity perspective, workers perceive this inequality as unfair. Following equity theory, we would hence expect:

Hypothesis 1: The relationship between intra-workplace pay inequality and employee trust in managers is curvilinear, inversely U-shaped.

The hypothesis developed in this chapter posits that the relationship between pay inequality and trust might be more complex than previously argued in literature on the macro level. Higher levels of pay inequality *can* lead to lower levels of trust, but the effect is potentially *not only* negative. Equity theory supports the idea of the perception effect, in that employees care less about inequality per se and more about the perceived fairness inherent in pay inequality. Yet, contrary to theoretical arguments on the macro-level, this also implies that inequality can be perceived as positive. Complete equality is likely to be perceived negatively, in that it does not reflect employees' differentials in inputs such as education, experience, responsibility or effort. It follows that low to moderate levels of inequality are likely to be perceived as positive because they are reflective of the internal differences. Where this point lies that separates the positive from the negative perception is yet to be identified.

3.6 Methodology

Chapter 2 established that this PhD research employs a survey-based approach using secondary data from the 2011 Workplace Employment Relations Study (WERS). In what follows I first describe the data sample in more detail before turning to the measures and statistical approaches used to analyse the data and test hypothesis 1.

3.6.1 Data sample

In this empirical chapter, I use two components of the 2011 WERS: the Management Questionnaire (MQ) and the Survey of Employees (SEQ). MQ data, which dealt with workplace level aspects, were collected through a face-to-face interview with the most senior manager responsible for employment matters at the workplace between March 2011 and June 2012, as well as through a self-completion questionnaire on workplace and workforce characteristics. For the SEQ a self-completion questionnaire was distributed to a randomly selected representative sample of up to 25 employees in each workplace. In total, 2,680 workplaces participated in the MQ. This equals a response rate of 46 per cent. Nested within these workplaces, out of the 40,513 employees who received a questionnaire, 21,981 completed the SEQ; which amounts to a response rate of 54 per cent. In the sample for this research, I kept only full-time employees, i.e. those working 35 hours or more in an average week, because part-time workers will have less opportunity for interaction with managers, and it is this interaction between employees and managers that builds the foundation for the theoretical model of this PhD project. This reduced the overall sample size of employees by around 7000 observations. Moreover, I dropped 28 workplaces with a zero Gini coefficient because this is likely to be a measurement error.

As already outlined in Chapter 2, I will run the models on three different samples. First, I'll run the analysis on the sample described above without sampling weights. Second, I'll run the analysis on the full sample with scaled weights for multilevel models. Third, I'll run the analysis on a sub-sample of medium and large workplaces with scaled weights for multilevel models. The scaling method will be described in the sub-section on the random intercept model.

3.6.2 Measurements

Dependent variable: employee trust

The literature is full of different trust measures (Colquitt et al., 2007; Lyon et al., 2015). Generally, researchers operationalize trust in three different ways: positive expectations (e.g. Byrne et al., 2012; Clegg et al., 2002; McAllister, 1995), the willingness-to-be-vulnerable (e.g. Knoll and Gill, 2011; Mayer and Davis, 1999; Mayer and Gavin, 2005), and direct questions

on the extent to which a person, a group of people or organisations can be trusted (Brockner et al., 1997; Holland et al., 2012).

In the WERS, trust items were included in the SEQ using a positive expectations approach. Employees' trust in managers, or rather managers' perceived trustworthiness, was captured by a three-item five-point Likert-type scale (Cronbach's Alpha (α) = 0.88). This measure of trust was utilised in previous employment relations literature (e.g. Brown et al., 2015; Innocenti et al., 2011; Ogbonnaya et al., 2017; Timming, 2012).

“Managers here...

- 1) Can be relied upon to keep their promises
- 2) Deal with employees honestly
- 3) Are sincere in attempting to understand employees' views”

The items are closely aligned to Cummings and Bromiley's (1996) definition of trust as an individual's belief that the trustee will act in line with commitments, behave honestly and does not take advantage of the trustor, as such taking into account the conceptualisation of trust developed at the beginning of this chapter, which stresses the positive expectation as necessary precondition for any trust relationship. They are also similar to the main items of Tzafrir and Dolan's (2004) model of organisational trust dealing with manager reliability (“managers will keep the promises they make”), harmony, and concern (“employees' needs and desires are very important to managers”).

Moreover, the measure fulfils Gillespie's (2015) requirement that all items should be consistent in terms of the trust referent. Whilst there is a consistent focus on “managers” rather than “supervisors” or “employer”, the term “manager” reflects two different though related and reinforcing forms of trust (Rousseau et al., 1998; McKnight, 1998). First, it describes an interpersonal trust relationship between individuals who are in direct contact, such as the employee and her line manager. Second, the measure can also reflect organisational trust, that is the trust that individuals have in their institutional environment (Tan and Tan, 2000), represented by the general management. Moreover, measuring trust in this way aligns well to the focus of this research on the positive perceptions of managers as the necessary condition for a positive trust relationship.

Independent variable: intra-workplace pay inequality

The measurement of pay inequality was derived from the MQ. Managers were asked to specify the number of employees in the workplace falling into one of six gross hourly pay bands. These six gross hourly pay bands range from “less than £5.93” to “£18.01 or more” per hour. To turn pay bands into concrete hourly pay values, I followed the approach employed by Bryson, Forth and Stokes (2018). I took the median value of each respondent’s five lowest earnings bands and multiplied the highest earnings band by a factor of 1.5 because it does not have a ceiling. This returned the six pay categories: £2.97, £6.72, £8.75, £11.50, £15.50 and £27.01 per hour. Next, I created two different measures of intra-workplace pay inequality. First, I calculated the Gini coefficient for each workplace based on the number of employees that fall in these six pay categories. Whilst there are replete measures of inequality, the Gini coefficient was chosen for its sensitivity to inequalities in the middle part of the income distribution (De Maio, 2007). This allowed me to focus more on inequalities among non-senior employees. Compared to other inequality measures, the Gini coefficient is easy to interpret, given its values range from 0 (complete equality) to 1 (absolute inequality where one person holds all the income). As a second inequality indicator, I calculated the coefficient of variance (VC). The VC is a ratio of the standard deviation of the income distribution to the average income (Champernowne and Cowell, 1998). Unlike Gini, the VC is heavily influenced by low and high values. I hence include two rather different measures of pay inequality, one focused on inequality in the middle of the pay distribution, and one more prone to pay inequality at the extreme ends. If I find a statistical relationship between trust and both measures, this indicates a more general relationship between intra-workplace pay inequality and employee trust in managers. If only one of the measures is significantly related to trust, this will suggest which parts of the pay distribution are more important for employees’ perception of and relationship with their managers.

Control variables

I included tenure, supervisory role, gender, occupation,—type of employment contract (permanent vs. temporary/fixed-term) and employee pay as control variables on the individual level, and workplace size, age and legal status (private vs. public/non-profit) as controls on the workplace level.

Tenure has been included because the longer a worker is employed in the workplace, the more information she can collect on the social exchange with her managers (Chan and Mak, 2014). This can turn out both positively and negatively. Having a supervisory role is predicted

to have a positive effect on trust in managers, because workers who are also managing are likely to have a closer association with managers and their social identity (Huang et al., 2010). Occupations are included to account for the heterogeneity of employees, and with it potentially different expectations about pay and its distribution. Type of employment contract might influence trust in two ways. First, those in fixed-term contracts might only be temporarily employed in the workplace which changes the social exchange with the managers. Second, those in temporary or fixed-term contracts might feel that manager do not trust them, otherwise they would have offered them permanent positions, which in turn leads to lower employee trust in managers (Svensson, 2011). Lastly on the individual level, employee pay is included because those with higher pay might have a later threshold of feeling unfairly treated compared to those with lower pay (Adams, 1965). On the workplace level, the size of the workplace in terms of employees might affect the contact employees have with their managers, and with it the general relationship between employees and managers. Workplace age might have a positive effect on trust, because in relatively new workplaces a culture of trust needs to be built from the ground up first. Lastly, the legal status of the firm might affect the general culture within the workplace, which in turn as an effect on employee trust in managers.

Descriptive statistics for all variables of the unweighted sample are reported in table 1 below. Intra-workplace pay inequality ranges from a Gini coefficient of as little as 0.05 to 0.45. With a mean Gini coefficient of 0.18, the level of intra-workplace pay inequality in the sample is well below the country-level Gini coefficient of 0.38 (OECD, 2021). When including workplace-level sampling weights, the mean value of the Gini coefficients decreases marginally to 0.17. One of the reasons for this difference lies in how income is measured on the county level, including, next to earnings, self-employment, capital income and public cash transfers (OECD, 2021). Another reason is likely to be the ceiling of £27.01 per hour, which exclude pay differences of the top 10 per cent of income earners in the UK (ONS, 2020). Lastly, as Barth et al. (2014) and Card et al. (2013) find, a large share of the increase in income inequality on the country level is also driven by between-organisation pay inequality, implying a growing division between high-paid and low-paid organisations. With a mean value of 3.33, the average level of trust in the WERS workplaces is slightly positive. This is lower than the mean value of trust when using the sample with original employee level weights (3.57), but the same as the mean value for the sample with scaled weights (3.33).

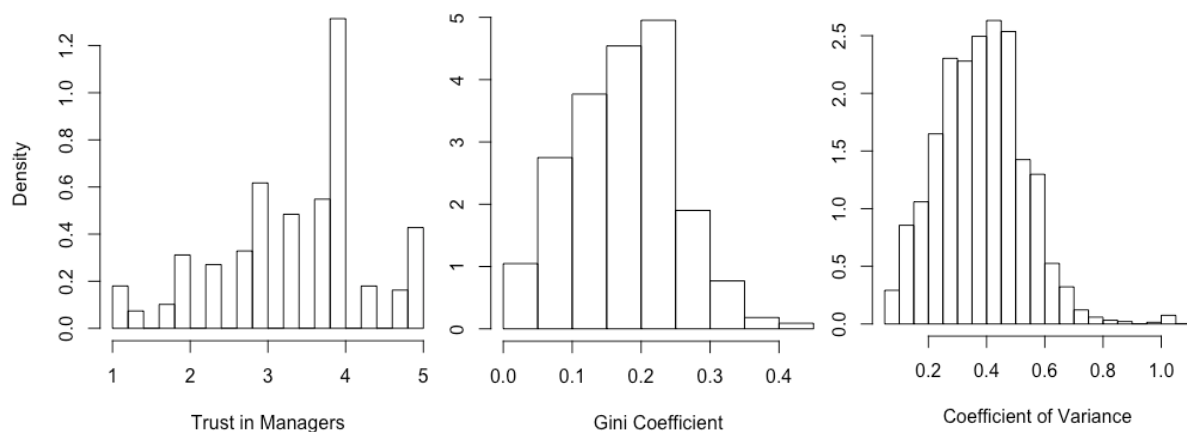
Table 1: Descriptive statistics for the direct relationship (unweighted sample)

	n	mean	sd	median	min	max	skew	kurtosis	se
Trust	13447	3.33	0.99	3.33	1	5	-0.46	-0.28	0.01
Gini	14694	0.18	0.07	0.18	0.05	0.45	-0.11	-0.37	0.00
Coefficient of variance	14764	0.38	0.13	0.39	0.06	1.17	0.27	0.75	0.00
Supervisory role	13696	0.39	0.48	1	0	1	0.47	-1.78	0.00
Gender	13846	0.56	0.49	1	0	1	-0.24	-1.94	0.00
Tenure	13896	3.55	1.31	4	1	5	-0.55	-0.78	0.01
Contract Type	13912	0.95	0.21	1	0	1	-4.21	15.72	0.00
Employee Pay	13355	555.41	333.65	476	31	1576	1.79	3.08	2.89
Occupation	13536	4.18	2.40	4	1	9	0.69	-0.63	0.02
Workplace Age	14270	4.65	1.74	6	1	6	-0.90	-0.69	0.01
Legal Status	14700	0.58	0.49	1	0	1	-0.32	-1.90	0.00
Employees (Total)	14694	481.15	1151.98	114	5.00	20746	0.72	-1.49	0.00

56 per cent of employees in the sample are male, 39 per cent have roles that include some form of supervision and 95 per cent have a permanent contract. The average workplace in the sample has 481 employees, ranging from as little as 5 employees to more than 20,000. The big drop from around 22,000 employees to the between 13,447 and 14,694 is due to the reduced sample of full-time employees. The remaining difference in observations between the variables is due to non-response.

Frequency plots for the main variables of interest – trust, Gini Coefficient, and VC – are illustrated in figure 4 below.

Figure 4: Histograms for main variables (sample with original level 1 and level 2 weights)



3.6.3 Statistical approach

To test the hypothesised non-linear relationship, I used two different statistical approaches. First, I applied a more traditional linear multilevel model with a polynomial term to account for potential non-linearity. Second, I employed random forest (RF) models, machine learning algorithms, which are better at detecting complex non-linear relationships (James et al., 2017).

3.6.3.1 Random intercept model

I employed a multilevel model due to the fact that the 2011 WERS is a hierarchical dataset where employees are nested within their respective workplaces. The inter-class correlation coefficient (ICC1) supported the use of a multilevel analysis, indicating that around 17 per cent of the overall variation in the trust variable are based on differences between average trust at workplace level. One of the key assumptions for unbiased linear regression coefficients, the independence of independent variables from the error term would be violated (Cohen et al., 2003). Since employees that are nested in the same workplace are likely to be more alike than those across different workplaces, the independence assumption is violated (Huang, 20128). By not accounting for the correlation between the error term and the independent variables in the model, the resulting standard errors for each coefficient are underestimated (Bell et al., 2019) which increases the likelihood of type I errors, that is false positives in terms of significance. Using multilevel analysis remedies the violation of this assumption by accounting for variances and two levels: level-1 (individual), level-2 (workplace). These differences would have been hidden had I aggregated the data to the workplace level or used a fixed effects model (Bell et al., 2019; Goldstein, 1995).

I used a random intercept multilevel model to estimate direct effects. Random intercept models assume that there might be different base levels of, in this case, trust among workplaces but that the general shape of the relationship between the outcome and predictor variables does not change from one group to the other. By assuming that the general shape of the relationship is the same across groups, random intercept models can hide heterogeneity, which might be present in the data, thereby causing biased coefficient estimates because standard error estimates are too small (Bell et al., 2019). Random slope models, on the other hand, assume that not only the base level, i.e. intercept, of the outcome variable, but that also the shape of the relationship between predictor and outcome variable varies across groups.

I, thus, ran both a random intercept and a random slope model and compared their fit using an ANOVA. The random intercept and random slope model fared almost identically when

looking at the direct relationship between pay inequality and employee trust in managers (see results for ANOVA in Table 2), suggesting that slopes do not vary significantly. Since a random slope model brings more complexity whilst it only performed marginally better, a random intercept model was chosen. Moreover, from a theoretical perspective I do not expect that the general slope of the relationship differs across workplaces but rather that the basic level of trust is likely to be different. This also implies the use of random intercept instead of random slope models.

Table 2: ANOVA – Random intercept vs. random slope model (direct relationship)

Model	Df	AIC	BIC	Loglink	Test	L.Ratio	p-value
Random Intercept	20	32264.55	32412.31	-16112.28			
Random Slope	22	32256.64	32419.17	-16106.32	1 vs 2	11.91	0.0026

I ran the model with the full maximum likelihood estimator that produces asymptotically efficient and consistent estimates (Maas and Hox, 2004). A maximum-likelihood approach aims to maximize the likelihood function, meaning that it finds the estimates of the model that “most likely produces the observed data” (Hox, 2002: 38). The use of maximum likelihood estimators is very common in multilevel models because they are robust against mild violations of regression assumptions in large datasets such as the WERS (Hox, 1992; Maas and Hox, 2004).

Equation 1 below represents the multilevel model for the direct relationship between intra-workplace pay inequality and employee trust in managers.

$$Trust_{ij} = \gamma_0 + \gamma_1 Pay\ Inequality_j + \gamma_2 Pay\ Inequality_j^2 + \varphi X_{ij} + \varpi W_j + u_{0j} + e_{ij} \dots\dots\dots Eq (1)$$

Where,

$\gamma_0 + u_{0j}$ = an intercept corresponding to workplace j (γ_0 - average intercept)

γ_1 = regression coefficient for the effect of pay inequality

γ_2 = regression coefficient for the effect of pay inequality squared

X_{ij} = person specific control variables

W_j = workplace specific control variable

e_{ij} = error term

As already briefly touched upon in Chapter 2, the WERS is not drawn from a simple random sample but rather from a disproportionally stratified sample, with a higher proportion of large workplaces as well as those from small sectors such as utilities in relation to the population of UK workplaces. Similarly, employees in small workplaces are more likely to receive a questionnaire than those in large places as only up to 25 employees are being asked to answer the questionnaire. To account for these biases and to turn the WERS into a representative sample, the dataset has separate sampling weights for each questionnaire.

For single level analysis, the inclusion of weights is straightforward. If one wishes to analyse the employee questionnaire, the dedicated weights that account for the likelihood of an employee to be surveyed are included. If one analyses the MQ, then the dedicated workplace level weights that account for the oversampling of large workplaces and those of small sectors are used (WERS, 2011 Technical report). When performing multilevel analysis, the processes is less straightforward but still possible and necessary to decrease potential biases if one wishes to make statements from the sample to the population as a whole (Asparouhov, 2006; Cai, 2013; Carle, 2009; Mang, 2021; Pfeffermann et al., 1998; Rabe-Hesketh and Skrondal, 2006; Stapleton, 2002).

Multilevel models that incorporate sampling weights for both levels of analysis typically employ pseudomaximum likelihood estimations, which aim to produce estimates that are consistent for the population (Asparouhov, 2006; Pfeffermann, 1998; Skinner, 1989). Using the “raw” single level weights for the SEQ and MQ may lead to bias in the variance estimates (Cai, 2013; Carle, 2009; Mang et al., 2021; Rabe-Hesketh and Skrondal, 2006) because the raw level-1 weights do not take into account the hierarchical nature between level-1 and level-2 units. Level-1 weights, hence, need to be rescaled to reduce the bias as much as possible (Pfeffermann et al., 1998; Rabe-Hesketh and Skrondal, 2006). The empirical evidence is, however, not completely consistent, with Carle (2009) finding that “weighted and unweighted data did not diverge greatly in general” and Mang et al. (2021) finding slight differences between scaled and unscaled weights when using the statistical programme SAS but no difference at all when using Mplus. The reason for the found difference between these programmes might be the application of different accelerating and optimization methods; yet due to the lack of transparency of these software packages the precise reasons are not known (Mang et al., 2021).

Despite the not completely consistent findings on the degree of bias when using no weights and unscaled weights, these studies consistently find that using rescaled level-1 weights are among the methods that achieve the least biased outcomes (Asparouhov, 2006; Cai, 2013;

Carle, 2009; Mang, 2021; Pfeffermann et al., 1998; Rabe-Hesketh and Skrondal, 2006; Stapleton, 2002). Two scaling methods have been repeatedly used and identified as reducing bias (Mang et al., 2021). The first method for scaling weights, from here on referred to as method A, readjusts level-1 weights so that they add up to the cluster sample size. This is depicted in equation (2) below:

$$w_{ij}^* = w_{ij} \left(\frac{n_i}{\sum_{j=1}^{n_i} w_{ij}} \right) \dots \text{Eq (2)}$$

where w_{ij}^* is the scaled weight for employee i in workplace j , w_{ij} the unscaled weight for employee i in workplace j and n_i equals the number of employees in each workplace j .

The second scaling approach, from here on referred to as method B, readjusts the original level-1 weights so that they add up to the effective cluster size. The effective cluster size takes into account the shared variance of employees (in terms of the interclass correlation) located in the same workplace, thereby reducing the actual to the effective sample size (Kish, 1965). The conditional employee-level weight is then given by

$$w_{ij}^* = w_{ij} \frac{\left(\sum_{j=1}^{n_i} w_{ij} \right)}{\left(\sum_{j=1}^{n_i} w_{ij}^2 \right)} \dots \text{Eq (3)}$$

Different simulation works highlighted that there is no golden standard in scaling methods for multilevel models because the nature of complex survey data and the relations among the data vary from dataset to dataset (Asparouhov, 2006) and sometimes even depending on the statistical software used (Mang et al., 2021). Rather than using a single scaling method, researchers using multilevel models should fit the model using unweighted and weighted data using both scale methods and then compare the results (Rabe-Hesketh and Skondral, 2006). In line with these recommendations, I will first run the multilevel model without sampling weights, and then scaled weighted data using method A and method B. As the sampling weights give more weight to small workplaces, wherein pay inequality might play less of a role in the social exchange and thus the trust relationship between employees and managers, I will also run the same models on a subset of medium and large workplaces.

3.6.3.2 *Random forest*

The problem with attempting to detect non-linear effects in linear regression models is that the quadratic effect needs to be very precise and clear around the inflection point. In other words, a curvilinear relationship which does not follow a perfectly inverted U-shape might remain undetected. I could have used other, more flexible linear regression approaches to detect the hypothesised non-linear relationship, such as step-functions or splines. Yet, unless the researcher is able to pre-determine the natural breaking points in the predictors, even these more flexible approaches can miss the true relationship (James et al., 2017). I, thus, turned to a more flexible, non-parametric method: random forest analysis. Developed in the field of computer science, this method is as yet relatively little used in organisational science (Choudhury et al., 2018; Puranam et al., 2018), but has been growing in popularity in fields such as economics (see Athey, 2019).

Random forest analysis, a class of machine learning algorithm, has been found to be better at identifying complex non-linear relationships compared to traditional forms of regression analysis (Goldstein et al., 2015; James et al., 2017; Svetnik et al., 2003). Random forest is a machine learning algorithm based on decision tree models. Decision trees are predictive models wherein algorithms consider all predictors in the model and choose the predictor and cut-off point to grow a decision tree that has the lowest residual sum of squares, i.e. that best explains variation in the outcome variable. The process is repeated by always looking for the next best predictor and cut-off point to split the data into further regions. Once all regions have been created by splitting the data, the mean value of the observations of the training data is used to predict test data observations. General decision tree models suffer from prediction inaccuracy due to large variance (Breiman, 2001). To remedy this issue, random forest (RF) models use bootstrapping, taking repeated samples from the training data, to build many separate prediction models, and then averaging the prediction of each separate model (Svetnik et al., 2003). However, rather than considering all predictors at each split of the tree, as is being done when using *bagging*, RF models only choose a random sample of predictors from the set of all predictors, that is, a fresh sample of m number of predictors is used at each split. This is an important step because it decorrelates the individual decision trees. Unless a random sample of predictors is chosen, there might be one especially strong predictor in the dataset that the majority if not all decision trees will use in the top split, thus leading all decision trees to be correlated. By choosing random subsets of predictors for each resampling, the strongest predictor might not even be considered.

Essentially, employing RF models consists of three steps. First, draw repeated samples (bootstrapping) from the training data. Second, for each sample grow a tree, that is, choose the best cut-off among a randomly selected subset of predictors at each node. Third, repeat this process until a pre-defined number of trees are grown. Of the output of all trees a final prediction is produced by averaging the individual tree predictions. Predictor importance scores can be calculated by swapping predictors with randomised out-of-bag observations and then comparing the old prediction accuracy with the new one (Breiman, 2001). The higher the decrease in accuracy, the more predictive power the variables had that was substituted with random noise (Svetnik et al., 2003). This is shown in equation 4 below.

$$f_i = \frac{\sum_j n_j}{\sum_k n_k} \dots\dots\dots \text{Eq (4)}$$

Where n_j is the importance of node j (data point); j' - splits on variable i ; k - all nodes on a decision tree.

$$F_i = \frac{\sum_q f_{ij}}{N} \dots\dots\dots \text{Eq (5)}$$

Equation 5 is the average of variable importance scores of all trees (q - trees in the model; f_{ij} – variable importance of variable i in tree j ; N – total number of trees).

As algorithms such as RF are being considered a “black box” (Svetnik et al., 2003), I used partial dependence plots (PDP) as graphical visualisation to derive the direction and magnitude of the relationship between the prediction and response variable. PDP are similar to marginal effects in linear regression models, in that they depict the *average* partial relationship between a predictor and an outcome variable (Goldstein et al., 2015). PDP is derived by equation 6 below.

$$f_{x_s}(x_s) = \int f(x_s, x_c) d\mathbb{P}(x_c) \dots\dots\dots \text{Eq (6)}$$

Where x_s is the selected feature for which partial dependence should be estimated while x_c denotes other explanatory variables in the algorithm f .

The function f_{x_s} is estimated by averaging the training data in the machine learning algorithm using the Monte Carlo method (equation 7).

$$f_{x_s}(x_s) = \frac{1}{n} \sum_{i=1}^n f(x_s, x_c^i) \dots\dots\dots \text{Eq (7)}$$

Where n is the number of cases in the dataset and x_c^i signifies the true values of other variables in the model.

Key parameters of the RF model were tuned up using a K-fold cross-validation procedure:

- number of trees = 500
- number of variables tried at each node = 3
- learning rate = 0.5

3.7 Results

Results will be presented in the same order as the statistical approaches above. First, findings for the linear multilevel random intercept model will be shown, followed by results for the random forest model.

Table 3: Regression results for the direct relationship between pay inequality and trust without sampling weights

	Dependent variable: Trust in Managers				
	(1)	(2)	(3)	(4)	(5)
Gini Coefficient	0.877*** (0.176)	0.600*** (0.174)		-0.358 (0.649)	
Gini Coefficient ²				2.274 (1.778)	
Coefficient of Variance			0.298*** (0.094)		0.316 (0.346)
Coefficient of Variance ²					0.022 (0.412)
Tenure		-0.098*** (0.007)	-0.098*** (0.007)	-0.098*** (0.007)	-0.098*** (0.007)
Supervisory Role		0.157*** (0.020)	0.158*** (0.020)	0.156*** (0.020)	0.158*** (0.020)
Gender (Male=1)		-0.040** (0.020)	-0.041** (0.020)	-0.039** (0.020)	-0.041** (0.020)
Type of Contract (Permanent=1)		-0.200*** (0.042)	-0.200*** (0.042)	-0.200*** (0.042)	-0.200*** (0.042)
Employee Pay		0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
SOC2		-0.224*** (0.036)	-0.222*** (0.042)	-0.224*** (0.036)	-0.222*** (0.042)
SOC3		-0.224*** (0.036)	-0.225*** (0.036)	-0.224*** (0.036)	-0.225*** (0.036)
SOC4		-0.196*** (0.040)	-0.197*** (0.040)	-0.196*** (0.040)	-0.197*** (0.040)
SOC5		-0.434*** (0.046)	-0.434*** (0.046)	-0.434*** (0.046)	-0.434*** (0.046)
SOC6		-0.152*** (0.050)	-0.150*** (0.050)	-0.157*** (0.050)	-0.150*** (0.050)
SOC7		-0.139** (0.057)	-0.142** (0.057)	-0.139** (0.057)	-0.142** (0.057)
SOC8		-0.463*** (0.049)	-0.463*** (0.049)	-0.465*** (0.049)	-0.463*** (0.049)
SOC9		-0.325*** (0.049)	-0.323*** (0.049)	-0.331*** (0.049)	-0.323*** (0.049)
Workplace Age		0.000 (0.007)	0.001 (0.007)	-0.000 (0.007)	0.001 (0.007)
Employees (Total)		-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Legal Status (1=Private for Profit)		0.122*** (0.027)	0.121*** (0.027)	0.122*** (0.027)	0.121*** (0.027)
Constant	3.187*** (0.034)	3.815*** (0.076)	3.808*** (0.078)	3.886*** (0.089)	3.808*** (0.078)
Observations (Employees)	13,447	11,720	11,720	11,720	11,720
Observations (Workplaces)	1,685	1,603	1,603	1,603	1,603
R ² (Level 1)	0.004	0.077	0.077	0.004	0.077
R ² (Level 2)	0.161	0.116	0.116	0.161	0.116

Note:

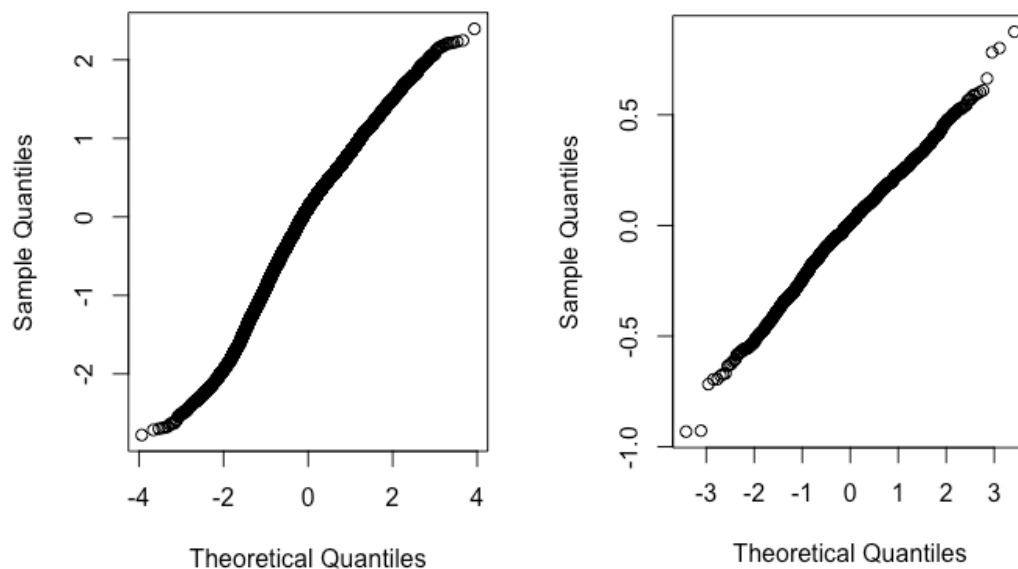
*p<0.1 **p<0.05 ***p<0.01

3.7.1 Linear multilevel random intercept model

The first question of interest is whether and how pay inequality is related to employee trust in managers. The results in table 3 suggest a *positive* association between the Gini coefficient and employee trust ($\beta=0.88$, $p\text{-value}<0.001$) for the unweighted model. After adding control variables, the size of the association decreased, but stayed significant and positive (Gini: $\beta=0.60$, $p\text{-value}<0.01$). Adding a quadratic term to the regression equation to test for potential non-linearity did not yield any significant results (see model 4, Gini $p\text{-value}=0.58$; Gini-squared $p\text{-value}=0.13$). Results for the coefficient of variance are in line with those for the Gini coefficient. These results do not support hypothesis 1 that the relationship is curvilinear and instead suggest a positive relationship.

Residual diagnostics show that the data is approximately Normally distributed (see figure 5 below) and that the variance of the residuals is equal across groups (see appendix).

Figure 5: Normality of residuals: residuals of fixed and random effects



Note: the left figure shows residuals of the fixed effects; the right figure residuals of the random intercept

As described in the methodology, in a second step, I included sampling weights for both levels in the MLM. Table 4 displays the results for the weighted multilevel models. Regressions (1), (2) and (3) show coefficients for scaling method A, whilst (4), (5) and (6) those for weighted regressions for scaling method B. After including the sampling weights, no significant results were found for the relationship between the intra-workplace pay inequality,

modelled both through the Gini coefficient and the coefficient of variance, and employee trust in managers.

Table 4: Regression results for the direct relationship between intra-workplace pay inequality and trust with sampling weights

	Dependent Variable: Employee Trust in Managers					
	(1)	(2)	(3)	(4)	(5)	(6)
Gini Coefficient	0.318 (0.357)	0.091 (0.352)		0.318 (0.357)	0.091 (0.352)	
Coefficient of Variance			0.072 (0.170)			0.072 (0.170)
Constant	3.552*** (0.068)	3.929*** (0.126)	3.583*** (0.071)	3.552*** (0.068)	3.929*** (0.126)	3.583*** (0.071)
Observations (Employees)	11720	11720	11720	11720	11720	11720
Observations (Workplaces)	1597	1597	1597	1597	1597	1597

Notes:

p<0.1 *, <0.05 **, <0.01 ***

(1) – (3) = complete sample with scaled weights method A

(4) – (6) = complete sample with scaled weights method B

(2), (3), (5) and (6) include control variables

One of the reasons for the non-significant results of the weighted data might be the stronger weight given to small workplaces as opposed to larger workplaces in the sample to restore representativeness. To test whether this is a reason for the non-significant results, I repeated the regressions on a sub-sample of medium and large workplaces (those with at least 50 employees). This further reduced the sample size to 8343 employees nested in 938 workplaces.

Table 5 includes regression results for the Gini coefficient and employee trust and table 6 for the coefficient of variance and employee trust for a sub-sample of medium and large workplaces with scaled sampling weights. For the Gini coefficient, after reducing the sample to medium and large workplaces, all weighted approaches suggest a significant and positive relationship between pay inequality and employee trust. Neither approach found a significant non-linear effect. For the coefficient of variance, the results are slightly different. For method A and B, the regression results suggest an inversely U-shaped relationship significant at a 5-per cent level.

Table 5: Regression results for the direct relationship between the Gini coefficient and trust for medium and large workplaces with sampling weights

<u>Dependent Variable: Employee Trust in Managers</u>						
	(1)	(2)	(3)	(4)	(5)	(6)
Gini Coefficient	1.365*** (0.363)	0.839** (0.316)	1.037 (1.125)	1.365*** (0.363)	0.839** (0.316)	1.037 (1.125)
Gini Coefficient ²			0.551 (2.946)			0.551 (2.946)
Constant	3.119*** (0.076)	3.837*** (0.152)	3.822*** (0.174)	3.119*** (0.076)	3.837*** (0.152)	3.822*** (0.174)
Observations (Employees)	8343	8343	8343	8343	8343	8343
Observations (Workplaces)	938	938	938	938	938	938

Notes:

p<0.1 *, <0.05 **, <0.01 ***

(1) – (3) = complete sample with scaled weights method A

(4) – (6) = complete sample with scaled weights method B

(2), (3), (5) and (6) include control variables

Table 6: Regression results for the direct relationship between the Coefficient of variance and trust for medium and large workplaces with sampling weights

<u>Dependent Variable: Employee Trust in Managers</u>						
	(1)	(2)	(3)	(4)	(5)	(6)
Coefficient of Variance	0.610*** (0.196)	0.353** (0.174)	1.391*** (0.573)	0.608*** (0.196)	0.353** (0.174)	1.391*** (0.573)
Coefficient of Variance ²			-1.237*** (0.616)			-1.237*** (0.616)
Constant	3.123*** (0.086)	3.848*** (0.158)	3.656*** (0.193)	3.123*** (0.086)	3.848*** (0.158)	3.656*** (0.193)
Observations (Employees)	8343	8343	8343	8343	8343	8343
Observations (Workplaces)	938	938	938	938	938	938

Notes:

p<0.1 *, <0.05 **, <0.01 ***

(1) – (3) = complete sample with scaled weights method A

(4) – (6) = complete sample with scaled weights method B

(2), (3), (5) and (6) include control variables

Overall, the results from the MLM suggest that there is a significant relationship between intra-workplace pay inequality – measured through both the Gini coefficient and the coefficient of variance – and employee trust in managers. Comparing the different data samples, weighted and unweighted for both the full and sub-sample of medium and large workplaces indicate that the effect manifests itself predominantly in medium and large workplaces. For the Gini coefficient the effect is found to be positive rather than inversely U-shaped, whilst it is found to be inversely U-shaped when using the coefficient of variance to measure intra-workplace pay inequality.

3.7.2 Random Forest Model

Before turning to the results for the hypothesised relationships, table 7 below shows the variable importance scores for all predictors in the model. It is clear from the variable importance scores that both intra-workplace pay inequality indicators, the Gini coefficient and the coefficient of variance, are predictors of employee trust. The workplace identifier was added to the RF model to account for the multilevel structure and the effect of the workplace on the individual employee.

Table 7: Variable Importance derived for direct relationship

	Employee trust in managers	
	Variable importance (permutation importance)	
	(1)	(2)
Gini	21.33	-
Coefficient of variance	-	19.66
Workplace identifier	13.04	11.95
Tenure	15.71	13.27
Employment contract	-0.13	1.50
Supervisor	12.62	14.63
Gender	8.50	8.36
Pay	21.52	20.44
Occupation	17.47	17.67
Workplace Age	12.02	12.60
Firm size	23.60	23.35
Number of trees	500	500
Number of variables tried at each split	3	3
Mean-squared residuals	0.919	0.925

Sample size: test data, N=2145 employee observations.

The reduced sample size of 2,145 employee observations results from the fact that the complete sample is split into training and test data. 70 per cent of the data is used to train the algorithm, which is then applied to the remaining 30 per cent on the test data.

Figure 6: PDP (Gini coefficient ~ trust)

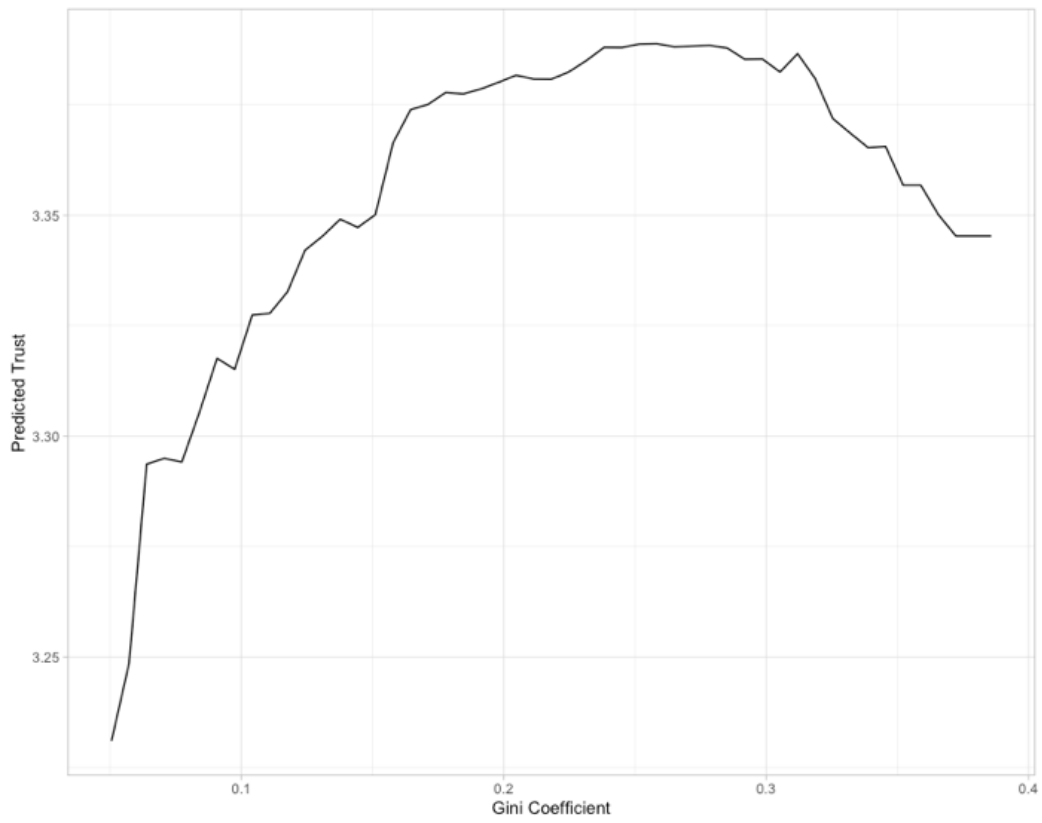
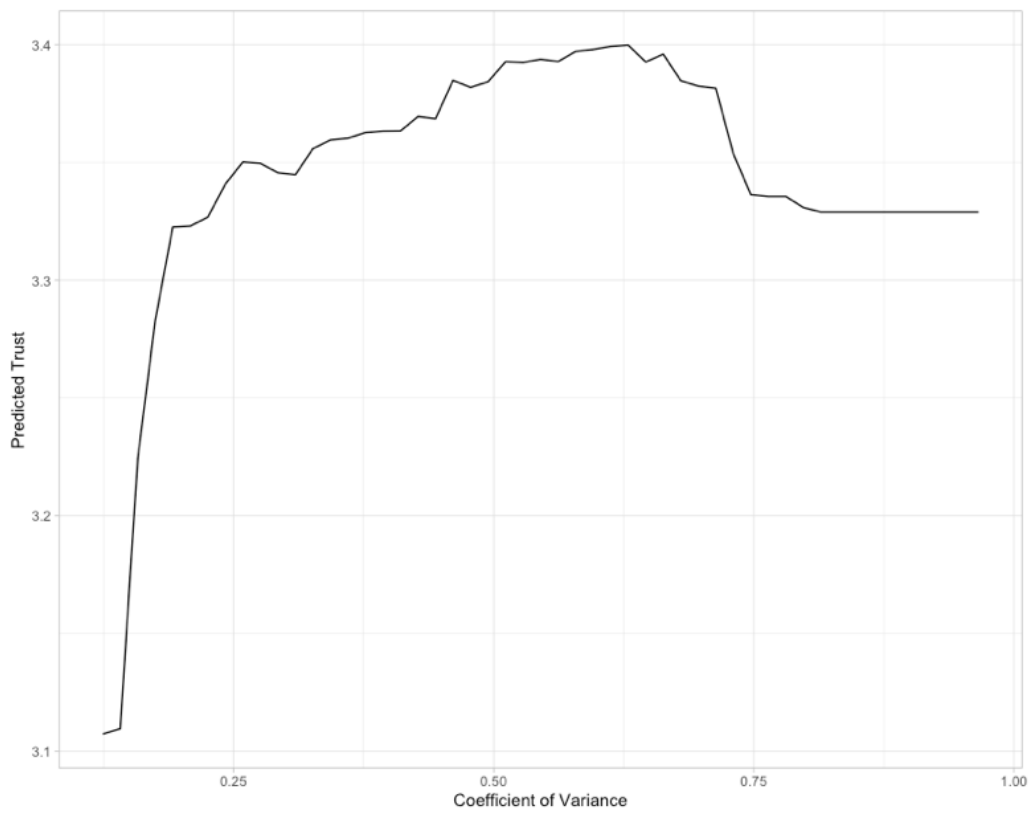


Figure 7: PDP (Coefficient of variance ~ trust)



PDP for the relationship between the Gini coefficient and employee trust (figure 6) and for the relationship between the coefficient of variance and employee trust (figure 7), both suggest a curvilinear relationship. In both figures intra-workplace pay inequality is depicted on the x-axis and predicted employee trust in managers on the y-axis. Looking at the Gini coefficient for ease of interpretation, there is a clear inflection point at ~ 0.25 , after which the previously found positive relationship turns negative. These findings support hypothesis 1. The size of the effect is, however, rather small. Trust does not change by more than 0.15 points along the whole range of the Gini coefficient, and by 0.3 points along the whole range of the coefficient of variance.

Overall, results from the random forest models support hypothesis 1: there is an inversely U-shaped relationship between intra-workplace pay inequality and employee trust in managers. This effect is found for two different pay inequality measures.

3.8 Discussion

This empirical chapter sought to answer whether the consistent findings on the macro level that there is a negative relationship between income inequality and trust in others does also hold when looking at intra-workplace pay inequality and employee trust in managers. It was hypothesised that, at the workplace at least, the relationship between the two phenomena is not necessarily *only* negative, but rather curvilinear, inverted U-shaped because some degree of inequality is necessary to reward employees for the different inputs, such as education, responsibility, effort etc. However, once inequality passes a threshold that separates what employees perceive as reasonable, fair differences, from non-rational, unfair differences, inequality will result in less trust.

Employing traditional linear regression approaches to detect non-linear relationships yielded mixed results. The random intercept model, using the non-representative sample without weights and the representative sample of medium and large workplaces with scaled weights suggested a positive link between the Gini coefficient and employee trust in managers. This is contrary to findings on the macro level and contradicts the hypothesis that inequality is only seen as positive up to a certain threshold. Only results using the coefficient of variance for the weighted subsample of medium and large workplaces suggested the hypothesised inverted U-shape. Results from the random forest model, suggests a clear non-linear, inversely U-shaped relationship between inequality and trust, both for the Gini coefficient and the coefficient of variance. First there is a positive link between pay inequality and employee trust, yet once the Gini coefficient passed a threshold of around ~ 0.25 , the relationship turns negative. To put this number into perspective, a Gini coefficient of 0.25 is lower than current level of inequality in the OECD country with lowest level of income inequality, which is Sweden with a Gini coefficient of 0.28 (OECD, 2021). Moreover, the established threshold of 0.25 is substantially lower than the currently level of income inequality in the United Kingdom (0.37) (OECD, 2021), where the analysed workplaces are nested in.

Implications of these findings for theory, methodology and practice are discussed below.

3.8.1 Theoretical Implications

First and foremost, results of this chapter suggest that the relationship between income inequality and trust also holds when looking at pay inequality and trust at a representative sample of medium and large workplaces and a large-scale sample of workplace of all sizes which oversamples larger workplaces and those in smaller sectors. On the one hand, this indicates a more general relationship between income inequality and trust than previously

established in that it extends macro level findings and experimental findings to the workplace level. On the other hand, by focusing on particularised trust employees have in their managers, findings from this research imply that the relationship between income or pay inequality not only holds for trust in strangers (Delhey and Newton, 2003, 2005; Elgar, 2010; Elgar and Aitken, 2010; Fairbrother and Martin, 2013) or trust in government and political institutions (Belabed and Hake, 2018; Lipps and Schraff, 2021; Schäfer, 2010; Zmerli and Castillo, 2015) but also for interpersonal forms of trust.

Second, the found curvilinear relationship between intra-workplace pay inequality and employee trust in managers, whilst supporting hypothesis 1, seems different from the of results for the negative relationship on the macro level (see for instance Barone and Mocetti, 2016; Fairbrother, 2014; Graafland and Lous, 2019; Larsen, 2013). Yet, considering the level at which the relationship between intra-workplace pay inequality and employee trust in managers turns negative – Gini coefficient ~ 0.25 – they seem to be in line with each other. On the country level, the lowest level of the Gini coefficient lies above 0.25 (OECD, 2021). One possible explanation why the relationship was only found to be negative thus arguably lies in the higher general levels of inequality on the macro level compared to the workplace level, where the Gini coefficient was as low as 0.02. A second possible explanation relates to predominant use of linear regression methods to understand complex relationships. Non-linear findings for the relationship between pay inequality and happiness on the macro level suggest that the second explanation is more likely (Yu and Wang, 2017). Yu and Wang (2017) hypothesised and found a non-linear relationship between income inequality and happiness both for longitudinal data for the US and cross-sectional data of European countries. For the three cross sectional analyses on European countries, the inflection points at which the relationship turns negative was suggested to be between Gini coefficient 0.25 and 0.3, whilst the inflection point for the USA was at Gini coefficient 0.37. The value for the inflection point established for UK workplaces in this research (Gini coefficient ~ 0.25) is in line with that of the European countries. This indicates that perceptions of inequality on the country and workplace level follow similar patterns. Interestingly, Yu and Wang's (2017) hypothesis was also based on Adams' (1965) equity theory to suggest when inequality will be perceived as positive and when as negative. This nonlinearity is a first indication of the prevalence of fairness perception as underlying mechanism as opposed to the role of interaction and shared values, with the latter suggesting that any increase in income or pay inequality increases the social distance and as such leads to the corrosion of trust.

The suggested non-linear direct relationship between pay inequality and employee trust in managers also chimes with findings on the organisational level, which related relative income to job satisfaction (Card et al., 2012). After information on pay was made transparent, those employees with earnings below the organisational median and particularly employees in the lowest quartile reported lower levels of satisfaction; yet not those with pay above the median (Card et al., 2012). This raises an important question: Is the negative relationship between intra-workplace pay inequality and employee trust in managers after the Gini coefficient ~ 0.25 mainly driven by employees with earnings below the median? Findings by Harris et al. (2008) suggest otherwise. The authors found that also those who are paid much higher than their comparison referent felt dissatisfaction. This clearly supports Adams (1965) rule of equity.

The research also identified intra-workplace pay inequality as a hitherto unconsidered antecedent of employee trust in management or superiors. Previous scholarly work established a robust link between organisational HRM practices and trust (see for instance Searle and Dietz, 2012, Whitener et al., 1998; Zeffane and Connell, 2003). Decisions on HRM practices are said to be “statements of intent which provide clues and signal as to the trustworthiness of the organisations”, which in turn “offers tangible evidence of the extent to which ... line management’s intentions are genuine and can be trusted” (Searle and Dietz, 2012: 334). For instance, Mayer and Davis (1999) found a positive effect of performance management systems on trust, Tzafir (2005) between training and internal promotional opportunities, whilst others have looked at groups of HRM practices such as high-performance work systems (Gould-Williams, 2003; Searle et al., 2011). The link to the management of actual pay levels adds to this strand of literature on the institutional factors of employee trust, which as Nienaber et al. (2015) describes in her review as less developed compared to individual level factors. The results of this chapter suggest that not only the practices but also their outcomes such as the distribution of pay are important for employee trust in managers. Albeit organisational in nature, the role of pay management gives room to individual level processes that function as causal chain between pay inequality and employee trust.

3.8.2 Methodological Implications

Results in this chapter demonstrated the value of employing more flexible, non-parametric statistical methods such as the machine learning algorithm random forests. The application of traditional multilevel regression models did not consistently identify a statistically significant curvilinear relationship and instead a larger share of results suggested a positive relationship

between intra-workplace pay inequality and employee trust in managers. The clearly identified inversely U-shaped relationship when using random forest models paints a completely different picture. The implications drawn for theory and practice, had I not applied random forest models, would have been different.

The reason for choosing random forest models was based on the non-parametric nature of this technique, which relaxes many assumptions used in linear and polynomial regression models (James et al., 2017). When researching complex relationships involving human relationships inside or outside the workplace relying on linear regression models bears the danger of oversimplifying the true nature of the complex relationships. The non-parametric nature of advanced statistical techniques such as random forest models allows researchers to think more openly about the true relationship rather than forcing to argue that a relationship is always positive or always negative. The results from this chapter should encourage other scholars who investigate complex, multidimensional phenomena using large datasets to make use of advanced statistical methods available. Whilst disciplines such as medical science (Balki et al., 2019) and economics (Athey, 2019; Mullainathan and Spiess, 2017) have already recognised the potential of using machine learning techniques, the results of this chapter should motivate employment relations and human resource management scholars to jump on the bandwagon.

3.8.3 Practical Implications

One take-away for managers and human resource practitioners is that intra-workplace pay inequality is likely to have an effect on the relationship between managers and employees, particularly in medium and large workplaces. Considering that trust in supervisors and managers is important for employee outcomes such as satisfaction, commitment (Choi, 2011; Colquitt et al., 2007; Timming, 2011; Top et al., 2015) as well as individual (Sharkie, 2009) and organisational performance (Brown et al., 2015; Tzafrir, 2005), this should be an important lesson. On the one hand, managers should therefore monitor how intra-workplace pay inequality levels compare to industry-wide inequality levels through industry pay benchmarking surveys. On the other hand, they should include the perception of pay inequality in management-employee discussions as well as staff attitude surveys. This is likely to increase feelings equity for internal and external pay comparisons.

3.9 Concluding Remarks

This chapter established a significant curvilinear relationship between intra-workplace pay inequality and employee trust in managers using large-scale employer-employee matched sample representative of mostly medium and large workplace in Britain. Yet, what explains this curvilinear relationship between intra-workplace pay inequality and employee trust in managers? Has it to do with fairness as Akerlof and Allen (1990) and more importantly Adams (1965) argued? And what role do shared values play? It is this type of questions regarding the underlying mechanisms that the next chapter seeks to answer.

Chapter 4: Theoretical underpinnings of the intra-workplace pay inequality – employee trust in managers relationship: the mediating role of fairness perceptions and shared values

In the previous chapter, I established a statistically significant relationship between intra-workplace pay inequality and employee trust in managers using secondary data representative of workplaces in Britain. The relationship between the two phenomena was found to be curvilinear. That is, at small and moderate levels of pay inequality, increases in pay inequality are associated with more trust in managers. Yet, once inequality passes a threshold, which was identified at a Gini coefficient around 0.25, any increase in pay inequality is associated with lower trust in managers. The next step, and the second question this PhD research set out to answer, is to ask how we can explain this found relationship. In other words, what are the underlying mechanisms that connect pay inequality and employee trust?

To answer this question, this chapter reviews previous explanations for the relationship between income inequality and social trust on the country level, identifying an increase in social distance and perceptions of fairness as the dominant presented theoretical explanations, albeit with little supporting empirical evidence. Using Adams' (1965) argument that it is not inequality *per se* that is important to the employee but the *perceived* fairness in the social exchange that is determined through meritocratic fairness principles, this chapter critically reflects on the concepts and assumption used by Adams. Using theories around the relationship between values and fairness views in combination with social comparison theory, I hypothesise a serial mediation, leading from trust to perceptions of managers fairness, continuing to perceptions of shared organisational values and ending in employee trust in managers. Results are generally supportive of the hypotheses. Implications for theory, methodology and practices are discussed.

4.1 Previous explanations for the income inequality – social trust relationship

Another essential missing puzzle piece in understanding the relationship between pay inequality and trust relates to the underlying theories and mechanisms to explain the predominantly found negative effect between income inequality and social trust. Among the different attempts to theoretically explain the relationship, two theories stand out. The first one, commonly labelled as “stratification effect” (Steijn and Lancee, 2011), relates to the reduced interaction in societies with higher levels of income inequality and the negative consequences that follow from it terms of diverging interests and beliefs. The second theoretical explanation

is often referred to as “perception effect” because it refers to the perception of income inequality as fair or unfair.

Those scholars who base their argument on the stratification effect posit that with increasing levels of income inequality the social distance between members of a society increases (Delhey and Newton, 2005; Jordahl, 2009; Olivera, 2015; Wilkinson and Pickett, 2011; Yang and Xin, 2020). On the one hand, social distance refers to the actual physical proximity between people. The different income groups, and especially the rich, decrease or even stop to interact with other income groups by living in fenced-off neighbourhoods, flying in their private jets or sitting in their closed off lounges in sports stadiums (Sandel, 2012). Since interaction provides people with information about the trustworthiness of others (Rousseau et al., 1998), income inequality is argued to affect trust negatively. On the other hand, greater social distance denotes an increasing disparity in (material) interests (Olin-Wright, 2015). When the gap between income groups widens, members of the different groups have less of an understanding about the situation, interests, needs and problems of the other groups (Rothstein and Uslaner, 2005). According to Coffé and Geys (2006), the combination of this divide in interests and the lack of interaction leads to the development of a different set of norms and values. Since people have a tendency to feel more comfortable around those who share similar beliefs and thus associate more with those people (Rokeach et al., 1960), income inequality is said to influence trust negatively.

Despite repeatedly engaging in discussions on this underlying mechanism there is little actual empirical evidence. Alesina and La Ferrara’s (2002) results for the negative effect of income inequality on trust in others, when studying communities in the USA, turns non-significant once they include a measure of racial and ethnic fragmentation. Another study on Australian neighbourhoods produces similar results (Leigh, 2006a). However, contrary to these findings on the neighbourhood level, Leigh (2006b), shows that when studying the same relationship on the country level, the effect of inequality remains statistically significant, whilst that of ethnic fractionalisation loses its significance. These findings imply that heterogeneity does in fact seem to negatively influence trust, though it is not clear if income inequality breeds heterogeneity or vice versa. Moreover, none of the aforementioned studies actually tested for the effect of heterogeneity, of any form, on shared values and preferences, the key mechanism that is said to be responsible for lower levels of trust. The exception to this might be Graaflad and Lous’ (2019) research on the mediating role of life-satisfaction inequality in the inequality-trust relationship. Whilst their findings suggest that income inequality breeds a disparity in how

we look at our lives, they fail to clearly relate this to a disparity in preferences, beliefs and values.

Next to the empirical limitation of directly testing this theory, it is also not clear whether the same mechanism might be one-to-one applicable to the workplace level and employee trust between employees and managers. On the one hand, employees and managers are interacting with one another, although the extent of this interaction might vary from workplace to workplace. On the other hand, working for the same company, in the same workplace provides employees and managers with a shared social identity (Ashforth and Mael, 1989). Theories closer to the workplace level and to employee-manager relationships might prove more fruitful in understanding the relationship between intra-workplace pay inequality and employee trust in managers.

Moving to the second underlying mechanism, researchers using the perception effect as theoretical underpinning argue that those with lower incomes perceive that the wealthy only got their high incomes by unfair advantage (Rohstein and Uslaner, 2005) and that they themselves do not have the power or means to change their fate to also earn higher incomes in the future (Uslaner and Brown, 2005; Steijn and Lancee, 2010). Stephany (2017) argues that the important difference between the two mechanisms is that the perception effect presupposes a reference group in order to make fairness judgement, whereas the stratification effect focuses on more general in-group out-group differences. By comparing their incomes with those of another referent, inequality can be perceived as based on unfair grounds, which might lead people holding such a belief to think that society itself and those in it are unfair and as such untrustworthy. For the perception effect socio-economic reference groups might hence strongly influence general trust in others.

Steijn and Lancee (2010) use a measure of perceived income inequality but do not find empirical support for a relationship between perceived income inequality and trust in others. Even if they had found evidence for the perception of inequality effect, the implications for theory would have been questionable. The reason for this lies in their operationalisation of perceived inequality. Although giving the example of fairness perceptions and fairness beliefs, the authors do not include a measure of fairness perceptions or views. Instead, they use answers to questions from the International Social Survey Programme that asked people to “estimate the actual incomes of nine relatively normal and cross-nationally comparable occupations (skilled factory worker, doctor in general practice, chairman of a large corporation, a lawyer, a shop assistant, the owner-manager of a large factory, a judge in the highest court and a cabinet

minister in the national government)” (p. 18). What they measured was thus not *perceived* inequality, as they theorised it, but rather a cut-out frame of people’s *assumed* level of pay inequality. Whilst such a measure is important in that it highlights the differences between actual levels of inequality and the level of inequality people assume to be present, it fails to capture people’s individual perception of income inequality as fair or unfair. The measure could have been useful had it been complemented by a third measure of inequality; namely what people think would be the ideal income for the aforementioned nine occupations. The difference between the ideal and the assumed level of inequality could then be used as an indicator of inequality perception (see Kiatpongsan and Norton, 2014).

Conversely, Uslaner and Brown (2005) do include three items that capture perceptions of inequality in their trust model by asking participants whether most people are getting better or worse, whether people advance in life by effort or luck, and how satisfied the individual is financially. The first item can be viewed as an individual’s perception of degree of social mobility in society (Alesina et al., 2018), the second item as an indicator for an individual’s perception of the source of income inequality (Cappelen et al., 2020), and the third one about the individual’s attitude about her own economic situation. Had the authors used these items as a mediator in the relationship between income inequality and trust, the results would have been able to suggest whether inequality perception is indeed an underlying mechanism for the proposed relationship. However, instead Uslaner and Brown (2005) only controlled for these items when regressing trust on inequality. We, hence, cannot make any statements about the relationship between levels of pay inequality and people’s perception of the inequality in terms of social mobility, source and own economic situation.

Work by Stephany (2017) introduces a more detailed account of the inequality perception effect by positing that the stratification and perception effect assume different trust reference groups. Whilst stratification looks at society at large, usually referring to others one does not personally know, the perception effect is based on comparisons with a socio-economic reference group that provide “a meaningful comparison” (Stephany, 2017: 880). Thus, rather than only looking at income inequality in society at large, it is important to also probe into inequality among reference groups. Stephany’s findings offer first evidence, showing that next to national level income inequality, income differences within certain age groups are negatively related to trust in others. The author’s efforts to advance our knowledge on the perception effect through the age-cohort study notwithstanding, the work lacks the main mechanism his theory rests on: “the perceptions, evaluations, expectations – in short, the psyche – of the individual” (Dahl, 1971: 95 in Stephany, 2017: 881). Put differently, do people trust others less because

they perceive their current economic situation as unfair? Similarly, it is not clear if age-cohort groups are adequate reference groups, rather than established referents such as colleagues at the workplace, industry or occupational benchmarks (Shore et al., 2006).

In sum, research on the income inequality – trust relationship has hitherto failed to directly test the proposed underlying mechanisms. Regarding the stratification effect, heterogeneity in terms of ethnicity and religion were utilised and linked to income inequality and trust. Yet, the problem of reversed causality was not solved. Moreover, the actual outcome of heterogeneity in terms of income, that is a growing value incongruence, was never directly tested. The same can be observed for studies attempting to test the perception effect. Whilst various proxies were used – assumed level of income inequality, causes of income inequality and age-cohort comparisons – people were never *directly* asked about their perception in terms of fairness.

4.2 The workplace as unit of analysis

Studying these proposed mechanisms on the workplace level is promising for several reasons. First, an important factor responsible for the increasing wage inequality is the rise in incomes of top earners (Atkinson, 2015; OECD, 2011; Piketty, 2014; Stiglitz, 2015). Piketty (2014) calls this development the “Rise of the Supermanager”, due to the vast increases in pay for top managers. Although income from capital plays a significant role in the growth of income inequality over the past decades (Atkinson, 2015; Piketty, 2014; Stiglitz, 2015), the explosion of top salaries is said to explain two-thirds of the growth in the top percentile’s share of the national income (Piketty, 2014). The growth of top salaries, fuelled by the increasing use of performance-related pay (Lemieux et al., 2009), particularly benefitted professionals in the financial sectors but also top executives in non-financial sectors (OECD, 2011; Piketty, 2014). In the USA the ratio between compensation of executives or CEOs and that of the average worker exploded from 20:1 in 1965 to 381:1 in 2007, before slightly decreasing to a current level of 321:1 (Mishel and Kandra, 2020). Similar trends can be found in the UK, 190:1 (The Equality Trust, 2017), and in countries like Germany and Switzerland, where the ratio has reached levels of around 140:1 (Kiatpongsan and Norton, 2014). Piketty (2014) argues that the explosion of executive salaries is also an outcome of social norms, in that the exorbitant salary increases of executives in UK and US corporations since the 1970s had to be tolerated or even felt to be justified. In that regard he goes on to posit that:

“It is also possible that the explosion of top income earners can be explained as a form of ‘meritocratic’ extremism’, by which I mean the apparent need of modern societies, and especially US society, to designate certain individuals as ‘winners’ and to reward them all the more generously if they seem to have been selected on the basis of their intrinsic merit rather than birth or background.” (p. 334)

Sandel (2020) supports this claim by Piketty, critically reflecting on the emergence of a widespread meritocratic belief that portrays top earners as deserving winners and those at the bottom and of the income distribution as deserving losers. The important take-away here is that the explosion of top salaries, and with it the rising level of intra-organisational pay inequality, does not seem to be based on internal differences. Rather, as Bertrand and Mullainathan (2001) show, the most rapid and steep increases in executive pay are based on external events. Similarly, a report by the Incomes Data Services (Tatton, 2014) on executive remuneration discovered that skyrocketing bonuses paid to FTSE 350 executives have been outpacing any performance and profitability developments, whilst the real pay of the average worker has stagnated or even declined (Piketty, 2014). Although the executive-to-average worker pay ratio is only one particular measure of pay inequality that focuses on the upper extremes, its stark increases invite questions about employees’ perceptions regarding the fairness of pay inequality increases on the one hand, and the role of shared values that might help to explain the acceptance of these developments on the other. Moreover, the fact that managers use their power and discretion for personal benefits highlights both the agency problem in management decision making (Bebchuck and Fried, 2003) and the role managers play in the surge in pay inequality. Adding to this notion of unfair pay differences are findings from Barth et al. (2014). The authors find that increases in intra-establishment wage inequality are largely the result of increased variance among workers with similar skills rather than from increases in the skill composition in establishments. In other words, workers with similar inputs are increasingly paid differently. With managers being at least partly responsible for pay decisions, focusing on employee trust in *managers* might offer some insights into whom employees attribute the growing inequality to.

Second, considering Stephany’s (2017) proposition that fairness perceptions around inequality are based on reference groups further supports the aim of the research in studying the relationship between income inequality and trust on the workplace level. A person’s workplace constitutes an environment full of comparison opportunities with colleagues and

supervisors in matters regarding outcomes such as pay as well as inputs such as effort, experience or responsibility (Greenberg et al., 2007). Or to use the words of Brown et al. (2001: 15): "If we look inside the firm, the stability of the pay structure becomes even more important. Employees' sensitivity to relative pay is all the more acute because they are in daily contact with the people in their comparative reference groups".

Since the perception of inequality effect relates to the view that some people got ahead of others due to unfair reasons outside the control of that person in the unfavourable position, studying the relationship between pay inequality and trust in the workplace level offers the chance to investigate this underlying mechanism in an environment with potential reference groups in a more clearly defined place of socialisation. The specific case of studying employee trust in managers is also important to increase our understanding of this effect. Next to the regular interaction managers have with their employees, they are responsible for pay decisions, and have the ability to explain these decisions to employees in an effort to increase employees' understanding and positively affect their perceptions (Bies and Shapiro, 1987).

4.3 What equity theory does and does not tell us

Adams (1965) argued that judgements of equity are based on social comparisons with others inside and outside the workplace. According to equity theory, managers or higher-ranking employees are not used as referents because employees compare themselves mostly horizontally when evaluating themselves, either to those similar within the firm or to workers in similar jobs in different organisations. Adams even argued that "a subordinate who compares himself to his supervisor or work group leader typically does not feel that he is unjustly treated by the company that employs them both, because the supervisor's greater monetary compensation, better working conditions and more interesting, more varied job are matched on the input side of the ratio by more education, wider range of skills, greater responsibility and personal risk, more maturity and experience, and longer service" (Adams, 1965: 282). Yet, from a strict equity perspective if an employee perceives that the pay difference between herself and her supervisor or a superior is too large for the difference in inputs, she will perceive to be unfairly treated. The first important point is that, in line with Stephany's (2017) argument for the perception effect on the macro level, social comparisons, that is pay referents, are being used to evaluate the fairness of the distribution of pay. This supports the theory that fairness perceptions are the underlying mechanism that connect pay inequality to trust. The second aspect worth mentioning is that such a view on differences between managers and fairness

highlights an underlying belief in the existence of a meritocracy, thereby giving room to the role of values.

Adams (1965) argued that where the inflection point lies that separates what people perceive as objective or fair disparities from unfair disparities, depends on normative expectations in respect to fairness in a society or among a group of people. Adams writes about a “process of socialization”. This can be interpreted as a reference to cultural aspects, that is differences in beliefs about inequality. Being located in the USA, Adams assumes that such a process leads employees to hold meritocratic beliefs about inequality. This belief in a meritocratic order becomes particularly clear when Adams refers to the higher pay of managers as to be seen as representative of effort etc rather than any external aspects. Although not directly referring to it, this aspect of equity theory suggests that values – a core element of the stratification effect – are linked to pay inequality because they influence how people make judgments about fairness. There is thus a theoretical link between values, which are beliefs about desirable end-states or means (Rokeach, 1973), and how people, or in this particular case employees, perceive pay inequality. This offers a new way of looking at the stratification and perception effect mentioned in the previous sub-chapter, suggesting that the two might not be mutually exclusive.

With the aim of establishing a theoretical explanation for the found curvilinear relationship between intra-workplace pay inequality and employee trust in managers, the following sections will review empirical evidence for Adams’ (1965) claims about a) the role of meritocratic value beliefs, and b) the use of social comparisons to judge equity in the distribution of pay.

4.4 Fairness beliefs: some common features among pluralistic beliefs

The starting point for any theorising about how people might react to inequality in outcomes, must be the study of values. Adams (1965) himself basis his theory of inequity in social exchanges and employees’ reactions to unfairness on a particular belief around the distribution of outcomes: the meritocratic principle of equity. Yet, equity is only one of several distributive fairness beliefs (Wright and Boese, 2015).

In an effort to understand variations of inequality levels and the presence of redistributive regulation – progressive taxation, social safety nets etc. – scholars such as Cappelen et al. (2007, 2013), Alesina and Giuliano (2011), Alesina et al. (2018) or most recently Almås et al.

(2020) investigated the role of people's fairness views. Fairness views can be broadly classified in three categories: egalitarian, meritocratic and libertarian (Cappelen et al., 2020). Egalitarians are in favour of an equal distribution of outcomes because inequality arising from both luck – external factors – and effort – internal factors – is perceived as unfair. Those holding meritocratic beliefs perceive inequality based on differences in effort as fair, but perceive inequality based on luck as unfair. Lastly, libertarians believe that any kind of inequality, whether it is an outcome of effort or luck is fair as long as it does not violate any law.

Experimental evidence suggests that inequality levels and support for redistribution can be explained by variations in people's fairness views. In a large-scale experiment with 7000 participants from the USA and Norway, Almås et al. (2020) found that Americans accepted significantly higher levels of pay inequality compared to Norwegians. The literature offers two possible explanation for this phenomenon. First, Almås et al. (2020) discovered that a larger share of Norwegians made redistribution decisions based on egalitarian fairness views, whilst a larger share of Americans made decisions based on libertarian views. However, and this is crucial, the largest group of participants in both countries, 42.5% in the USA and 37.5% in Norway, based their discussions on meritocratic beliefs. Their findings are in line with those of Cappelen et al. (2007), that found meritocratic views as the dominant fairness view, as well as those of the aforementioned study by Kiatpongsan and Norton (2014), which finds that whilst participants of countries vary in the extent to which they want to reduce inequality, they all a) prefer inequality over equality, and b) are in favour of reducing the current level of inequality in their country. The second reason for why, let's say, Americans accept a higher level of inequality as fair compared to Norwegians is said to be based on their perception of the *source* of the inequality (Cappelen et al., 2020). Alesina et al. (2018) found US Americans to be much more optimistic about social mobility compared to different European countries. The optimistic view of social mobility means that US Americans have a stronger belief that people are able to reach higher income levels than those they were born into by their own efforts. This in turn implies that US Americans are more likely to perceive that those who earn a high income have reached this position by their own means, compared to the European countries that were studied, which substantiates Adams' (1965) argument about the higher pay of supervisors as fair.

Overall, these findings imply that meritocratic beliefs are the dominant fairness view across wealthy Western countries. It follows that there should be a threshold that separates what

people perceive as rational, fair distribution of pay from what people perceive as an unfair distribution of pay. It is only the extent to which and the level at which inequality is seen as fair or unfair that might vary depending on the country of study. The higher the share of people holding libertarian worldviews and the higher the share of people believing that most inequality is the source of individual effort rather than luck or “illegitimate means”, the higher the level inequality needs to reach before it is perceived as unfair. These studies support equity theory’s prediction that the relationship between pay inequality and fairness, and thus between pay inequality and employee trust in managers, is likely to be curvilinear or inversely U-shaped. They also suggest that both values and fairness perceptions are associated with inequality; more specifically how people view and potentially react to certain levels of pay inequality. The next section will discuss how the previous macro-level evidence presented in this section relates to pay inequality on the organisational level.

4.4.1 The pay inequality – fairness – employee trust relationship

The prediction of equity theory (Adams, 1965) that inequality can result in a feeling of relative underpayment or overpayment, meaning that inequality triggers feelings of unfairness and dissatisfaction has been supported by ample empirical evidence (see for example (Austin et al., 1980; Carrell and Dittrich, 1978; Goodman, 1974; Harris et al., 2008; Pritchard, 1969; Summers and DeNisi, 1990; Sweeney, 1990; Williams et al., 2006). Recent findings in the field of neurology suggest that not income inequality triggers emotional reactions in the brain, but rather the unfairness that people associate with certain levels of inequality (Cappelen et al., 2014, 2020; Guo et al., 2014). In their literature review titled “Why people prefer unequal societies”, Starman, Sheskin and Bloom (2017) summarise the empirical evidence on people’s preferences for inequality emphasising that “... there is no evidence that people are bothered by economic inequality itself. Rather, they are bothered by something that is often confounded with inequality: economic unfairness” (p. 1). Both, from a theoretical *and* empirical perspective it is thus not inequality per se that has an effect on the trust relationship between employees and their managers, but rather the feeling of being (un)fairly treated that results from the individual employee’s *perception* of the distribution of pay within the workplace. This empirical evidence strongly supports the role of the perception of pay inequality in terms of fairness as the mediator between intra-workplace pay inequality and employee trust in managers.

Fairness perceptions have been identified as an antecedent of both employee trust in superiors and employee trust in management. In their influential work on trust in organisations, Mayer et al. (1995) developed a model of trust that differentiated between trust, the willingness of an individual to be vulnerable to the actions of others without the option to monitor the other party's behaviour based on positive expectations, and trustworthiness, a set of character skills of the trustee that act as antecedents for trust by the trustor. Different empirical studies found that, out of the three factors of trustworthiness – ability, benevolence and integrity – benevolence and integrity are more important for subordinate trust in superiors. In their study on trust in upward, downward and lateral relationships using a sample of 187 Canadian human resources professionals, Knoll and Gill (2011) found all three factors of trustworthiness to be important antecedents of trust. However, the effect of integrity and benevolence was more than twice as strong for trust in superiors. Similarly, results of Colquitt et al.'s (2007) meta-analysis of 119 articles found integrity to be significantly more important in trust in leaders than trust in co-workers. Last and in line with these findings, Lapidot et al.'s (2007) rare qualitative study using critical incidents methods to study trust of Israeli Defence Forces cadets in their team commanders, identified integrity and benevolence as more important for trust building and trust erosion compared to ability.

These are crucial findings. First, integrity and benevolence are both affective concepts whilst ability has more cognitive elements. This emphasises the importance of affective elements for employee trust in superiors. Second, integrity, which Mayer et al. (1995) define as “a set of principles” the trustee adheres to and that the trustor, in this case the employee, finds acceptable, includes notions of fairness and values. These results are in line with earlier empirical findings on the importance of integrity and fairness for trust (Butler, 1991). More recent evidence by Matta et al. (2020) suggests employee trust in supervisors as mediator between perceived supervisor fairness and supervisor-directed citizenship behaviour, thereby further substantiating the role of perceived supervisor fairness for employee trust in supervisor/line manager.

The importance of fairness is also found when looking at employee trust in the general management. Alexander and Ruderman's (1987) study of 2800 US federal government employees revealed that employees' distributive fairness perceptions, that is whether they perceived their pay to be fair in general and compared to others outside and inside the organisation, were significantly linked to trust in management. In line with this finding for public employees, results of DeConinck's (2010) study, applying structural equation modelling

to two sets of randomly selected marketing employees in the US, suggest distributive fairness perceptions to be directly linked to trust in management, and indirectly to trust in supervisors through perceived supervisory support. Whilst these two studies are limited to specific occupational groups in the US, two different meta-analyses, each analysing a sample of around 190 independent studies, are supportive of the relationship between all three fairness dimensions – distributive, procedural and interactional – and employee trust in management and superiors (Colquitt et al., 2001; Cohen-Charash and Spector, 2001). Relating fairness directly to pay, a recent global survey of 9800 employees in the US, Mexico, Brazil, Germany, the UK, India, Japan and China, found “employee compensation is not fair” as the top factor in explaining a lack of trust in the employer, whilst 63 per cent of the surveyed employees named fair compensation and good benefits as among the most important factor for trust in employers (Ernst&Young GmbH, 2016). It follows that a fair distribution of outcomes such as pay is positively linked to employee trust in managers.

As I argue that perceptions of distributive unfairness result in feelings of being unfairly treated in the social exchange, it is important to see whether similar findings also hold for the relationship between interactional justice, that is fairness of the interpersonal treatment (Bies, 2005; Bies and Shapiro, 1987), and employee trust in managers. In this respect, the study of Barling and Philips (1993) was the first one to test the relationship between interactional justice as distinct from fair formal procedures, i.e. procedural justice. In a vignette manipulation study with 213 full-time Canadian students, the scholars found that both interactional and procedural fairness concerns were positively related to employee trust in management. Almost a decade later, in an effort to untangle the slightly different sources of procedural and interactional fairness perceptions, Ayree et al. (2002) discovered that both forms of justice were associated with employee trust in management, yet only interactional justice was additionally related to employee trust in supervisors. Perceived organisational support was found to partially explain the relationship between procedural justice and trust in management, whilst perceived supervisory support with its interpersonal character, was found to partially explain the association between interactional justice and trust in supervisors (Stinglhamber et al., 2006).

The empirical evidence presented in this section generally supports the implications derived from equity theory that a) it is the inherent notion of (un-)fairness in inequality rather than inequality itself that workers care about, and b) that the resulting feelings of fairness, both distributive and interactional, influence whether workers view those responsible for the

perceived (un-)fairness as trustworthy. This deductive reasoning aids the hypothesis for research question 2, the mediating role of fairness perceptions. I thus expect:

Hypothesis 2a: Employees' fairness perceptions mediate the relationship between intra-workplace pay inequality and employee trust in managers.

The main tool to judge distributive fairness, as identified by Adams (1965), are social comparisons with others inside and outside the organisation. In an effort to bring more clarity in how fairness perceptions are formed around the distribution of pay the next section will critically reflect on the social comparison literature.

4.4.2 Social comparison and the relationship between inequality and perceived fairness

Whether it is performance appraisals, co-workers competing for a promotion or pay and reward systems, social comparisons “are deeply embedded into the fabric of organizational life” (Greenberg et al., 2007: 23). Studies in economics, management, and organisational psychology have found repeated evidence from surveys of both employees (Blau, 1994; Card et al., 2012; Downes and Choi, 2014; Goodman, 1974; Oldham et al., 1986; Shaw, 2014) and HR managers (Agell and Lundberg, 1995; Blinder and Choi, 1990) that relative wages are crucial for an employee's perception of an organisation's internal pay structure. Whilst this work supports equity theory's proposition that employees use comparisons to evaluate their pay, it fails to address three important questions: Why do employees engage in pay comparisons? Who is the employee's comparison referent? And what are the resulting effects of this comparison process? Identifying the direction of pay comparisons is a crucial element in understanding the potential link between pay inequality and employee trust in managers. It is the direction of the comparison that affects the individual making the comparison and the relationship between the individual and those responsible for the outcome of the comparison.

In line with Adams' (1965) proposition that employees evaluate the social exchange with their employer or managers by engaging in both internal and external comparisons, empirical evidence, almost exclusively covering the US, Australia and Canada, suggests employees use multiple referents inside and outside the organisation to evaluate their pay (Brown, 2001; Brown et al., 2007; Goodman, 1974; Heneman et al., 1978; Martin and Lee, 2005; Shore et al., 2006). Yet, the importance of internal and external referents varies. Managerial employees higher up and in particular those on top of the internal hierarchy tend to seek external

comparisons, that is with others in similar positions outside the organisation (Oldham et al., 1986; Tremblay et al., 1997), whilst the rest is more likely to seek internal comparisons. The authors suggest the decreasing availability of internal referents as one possible explanation for this finding. This implies that for the majority of employees, in particular those without managerial responsibilities, internal comparisons and the distribution of income in relation to those internal referents is most important to evaluate the fairness of their pay and as such the exchange relationship with their managers. Though, the selection of the explicit internal referents depends on the employee's motivation for comparing herself.

In his pioneering work, Leon Festinger (1954) argued that since the primary reason for comparisons is to evaluate oneself, people seek comparisons with those who are fairly similar. Yet, as Corcoran, Crusius and Mussweiler (2011) explain in their excellent literature review on the expansion of the social comparison literature since Festinger's (1954) work, the reasons for engaging in comparisons go beyond the need for self-evaluation. Next to saving cognitive resources when gaining self-knowledge (Mussweiler and Epstude, 2009) and facilitating communication with others (Huttenlocher et al., 1971), comparisons are used for self-enhancement and self-improvement purposes (Corcoran et al., 2011). In other words, social comparisons serve instrumental needs (Austin, 1977).

Based on the need for self-evaluation, Festinger (1954) argued that the only way to yield accurate knowledge about the self, is to engage in comparisons with people who are similar to oneself on the dimension one is interested in e.g. the 'critical dimension'. Any comparison with people who are dissimilar would generate ambiguous knowledge for the person engaging a comparison process (Festinger, 1954). Employees engaging in internal pay comparisons would hence choose co-workers in the same position or with the same job title. It is exactly this line of thought Adams used to base on his argument about referent selection in equity theory. Later on, Goethals and Darley (1977) hypothesised that it might be less about similarity on the critical dimension and more about having similar attributes to the referent person. Although different, these two hypotheses are not mutually exclusive. Empirical evidence suggests that both kind of similarities, on the critical dimension and on related attributes, are crucial criteria in the referent selection process (Corcoran et al., 2011). This implies that in order to evaluate her pay an employee could choose either someone with the same occupation, someone working on a similar level in the same company, or someone with a similar income. Simply put, people tend to choose those similar to themselves for an accurate *self-evaluation*.

On the other hand, people are, as mentioned before, not only interested in self-evaluation but also in self-enhancement and self-improvement. In these instances, people might deliberately choose to compare themselves to others who are *dissimilar* on the critical dimension or related attributes (Dornstein, 1989; Suls et al., 2002). There are two ways for an individual to increase or at least maintain a positive self-image. The first option, as Wills (1981) argues, is for people to engage in downward comparisons, i.e. with those who perform worse than one. By selecting someone of inferior standards, the individual's performance seems relatively favourable, which, as corollary, leads to an enhancement of their self-view. In cases where people are more concerned about self-improvement, which people in our society are constantly being told to be concerned about (Sandel, 2020), they might choose upward comparisons, that is, comparisons with those who are better than them. Indeed, empirical evidence from the organisational level suggests that employees engage in upward, downward *and* lateral comparisons (Brown et al., 2007; Harris et al., 2008). Whilst the choice of comparison is situation dependent (Buunk and Gibbons, 2007), Harris et al.'s (2008) study on both a U.S. and a Belgian sample of employees, Clark and Senik's (2010) work using a sample of 18 European countries from the European Social Survey and Tao's (2015) findings from a sample of 38 countries from the International Social Survey Programme all suggest that employees are more likely to engage in upward comparisons.

As upward comparisons are used for self-improvement purposes, they serve two potential needs. First, upward referents act as a motivator of what one wants to achieve (Pavlova et al., 2018), and second, they provide people with information on how to get there (Bandura, 1986). The higher pay of others can thus act as a signal of potential future earnings (Godechot and Senik, 2015). In these cases, pay inequality is more likely to be perceived as positive. Nevertheless, the positive effects of upward comparisons depend on the perceived mutability of the self (Suls et al., 2002), the attainability of the comparison standard (Lockwood and Kunda, 1997) and whether the difference can be internally attributed (De Cremer, 2002; Smith et al., 1994). Comparing wages with someone superior such as a line-manager, could hence be a motivation to work harder in an effort to reach such a position if the employee is willing to change *and* if the higher position is perceived as attainable through one's own efforts. However, if the higher pay of others is perceived to result from external reasons that lie outside the control of the employee, the upward comparison and thus the difference in pay is more likely to be perceived as negative (Cohen-Charash and Mueller, 2007; Kepes et al., 2009). This negative perception of inequality will be a strain on the relationship between employees and

their managers, with employees likely to feel unfairly treated, resulting in lower trust in managers as those responsible for pay matters. These findings are generally in line with the findings by Cappelen et al. (2017), Almås et al. (2020) and Starvas et al. (2017), all pointing to meritocratic fairness belief that reflects a curvilinear relationship between pay inequality and perceived fairness.

This implies that so long as the difference in pay can be attributable to internal differences, may it be productivity, experience, effort or education, employees will perceive pay inequality as fair. Yet, when inequality reaches a level where the pay of those above are perceived to be based on external factors that employees have not influence over, they will perceive the distribution of pay as unfair. I thus expect:

Hypothesis 2b: The association between intra-workplace pay inequality and perceived manager fairness is inversely U-shaped.

Considering that fairness perceptions are rooted in values, what does the perceptions of unfairness say about the values of the organisations and thus to the employees?

4.5 The role of shared values

Values, which Milton Rokeach (1973) defines as beliefs about desirable end-states or means significantly influence how individuals judge the fairness of both outcomes and procedures (De Cremer, 2002; Feather, 1994, 2002; Fischer and Smith, 2006; Lipponen et al., 2004; Skitka, 2002; Skitka and Mullen, 2002; van Prooijen et al., 2008). The distributive justice principle of equity, with its focus on individual inputs and outcomes on the one hand, and its emphasis on relative pay and standing, on the other hand, is closely aligned to, what Van Lange et al. (1997) described as the proself value orientation. The proself, constitutes one of three broad value orientations, which combines the two value orientations which are aimed at maximizing the individual's outcomes in both absolute (individualists) and relative (competitors) terms (De Cremer and Van Lange, 2001).

In his scenario study on the allocation of reward for different work outcomes, DeCremer (2002) found that when the equity rule is violated and individuals are instead paid equally only those individuals with a proself value orientation were negatively affected, not those with a prosocial orientation, which aim to maximise joint or group outcomes. Similar findings on the effect of an individual's value orientation were found for individuals' judgment on the outcomes of political institutions (Skitka, 2002; Skitka and Mullen, 2002) industrial conflict

(Feather, 2002) and of reward allocations at the workplace (Lipponen et al., 2004). In a survey research on the relationship between value preferences and parents' allocation of pocket money, Feather (1991) found individualist, effort-related values to be positively associated with independence training but negatively with meeting the child's need when allocating money, whilst communal and caring values to be associated with family harmony and the child's needs. Put differently, individualistic values or proself value orientations were linked to principles of equity, and those related to communal welfare and family harmony to equality and needs. Growing up and living in a society wherein the majority of the population beliefs in a meritocratic order based on principles of equity (Almås et al., 2020; Cappelen et al., 2020), *ceteris paribus*, inculcates an individual through a, as Adams (1965) described it, "process of socialization", the idea of equity as overarching justice principle and consolidates the idea of inequality as an outcome of different levels of individual effort rather than structure. If values influence what people perceive as fair distribution of pay, the perception about a fair distribution of pay vice-versa tells us something about the values they hold.

From this it follows that intra-workplace pay inequality can act as a signal of shared values to its employees. If an employee perceives the current level of pay inequality as unfair, the management who established the pay structure and the employee have different values resulting in differences of judgement about what constitutes fair pay. Conversely, perceiving pay dispersion as fair signals the employee that both parties share similar values. For instance, an employee with a strong proself value orientation would perceive a workplace with a flat pay distribution despite large discrepancies in inputs as unfair and would not feel that her values in regard to distributive justice outcomes align with those of her managers or the organisation. In contrast, an employee in the same workplace with a strong prosocial value orientation, believing in principles of equality or needs rather than equity, would not only perceive the distribution as fair, but would also feel that her managers or the general management of the firm, i.e. those who established the pay structure, must share similar values in terms of the allocation of pay. It follows that fairness perceptions resulting from pay inequality can either be perceived as value congruent or value incongruent.

It is this notion of value congruence that is fundamental to the development of high-level trust relationships that exceed simple task reliability. Jones and George (1998), on whose model this research heavily draws, argue that in high-trust relationships, which they label unconditional trust, "shared values ... structure the social situation and become the primary vehicle through which those individuals experience trust" (p. 1997). These scholars are not

alone with this emphasis on shared values. Barber (1983), on whom Jones and George partly base their argument, suggested that trust and shared values are mutually dependent. Trust both helps to maintain shared values and serves as an expression of shared values, whilst shared values are the point of departure for any high-level trust relationship. Similarly, Sitkin and Roth (1993) posit that shared values suggest a level of trustworthiness that goes beyond non-affective forms of trust, which they specify as task reliability, and that trust based on shared values refers to a belief that the trustee will approach *all* situations in a way that the trustor finds acceptable. This clearly resonates with Jones and George's "unconditional trust". Lewicki and Bunker (1995) describe the highest stage of trust as a stage, in which both parties have entered a rather close relationship based on the shared preferences, values and intentions. Referring to trust in organisations, Fukuyama (1995: 10) wrote that "out of ... values comes trust", later expanding on this notion to argue that:

"Trust is the expectation that arises within a community of regular, honest and cooperative behaviour, based on commonly shared norms, on the part of other members of that community. Those norms can be about deep "value" questions ... but they can also encompass secular norms like professional standards and codes of behaviour... While contract and self-interest are important sources of association, the most effective organizations are based on communities of shared ethical values" (p. 26).

In the arguably most impactful paper² on trust in organisations, Mayer et al. (1995) posit integrity and benevolence as two of three factors of trustworthiness. Their definition of integrity as sharing a set of principles is in line with Jones and George's (1998) definition of shared values as set of common principles. Similarly, benevolence, "the extent to which a trustee is believed to want to do good to the trustor, aside from an egocentric profit motive" (Mayer et al., 1995: 718), is a value-laden construct that clearly implies a pro-social rather than pro-self value-orientation. Thus, despite fundamental differences about the concept of trust and trust development among the above-mentioned authors, there seems to be an agreement on the vital role of shared values for higher levels of trust development.

Several studies in different research domains have empirically supported the notion that shared values are trust enhancing (Beugelsdijk and Klasing, 2016; Siegrist et al., 2000). Testing

² Impact here is purely defined in quantitative terms by the number of citations on google scholar

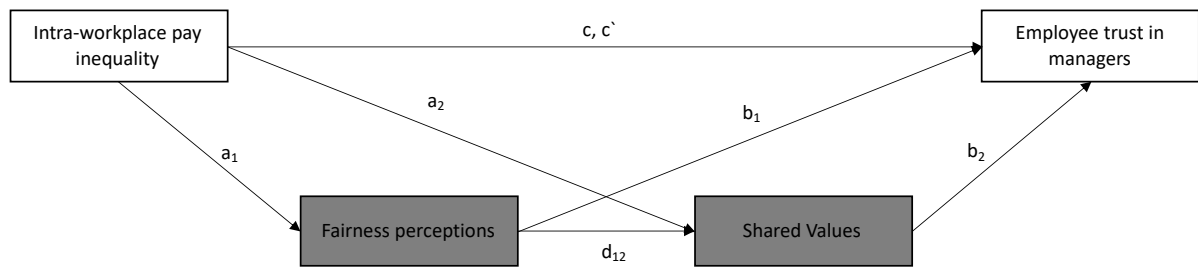
the salient value similarity model (Earle and Cvetkovich, 1995), Siegrist et al. (2000) found that sharing the same values as the institution responsible for regulating environmental aspects were an important antecedent for the trust people had in these institutions. Beugelsdijk and Klasing (2016) used responses to the values questions in the World and European Value Surveys to calculate a value diversity index based on Esteban and Ray's (1994) polarization index. The authors found that in countries with high value diversity, particularly in relation to income redistribution and the role of government, people had less generalized trust in others. Moreover, using panel data revealed that large increases in value diversity were associated with decreases in trust. In respect to Mayer et al.'s (1995) factors of trustworthiness, Knoll and Gill (2011) discovered that the association of value-laden constructs integrity and benevolence were more than twice as strong for trust in superiors compared to the third trustworthiness factor ability. Similar results were found in Colquitt et al.'s (2007) meta-analysis and Lapidot et al.'s (2007) qualitative work using critical incidents technique.

Taken together these two strands of literature, the fairness-value relationship and the value-trust relationship, seem to suggest a mediating role of shared values in the relationship between fairness perceptions and employee trust in managers. An employee evaluates the current level of inequality as fair or unfair based on her *beliefs* about the fair distribution of pay. She then enters a comparison process. If, on the one hand, the employee comes to the conclusion that the current distribution of pay, established by the management of the firm, reflects principles of fairness in respect to the distribution of pay, she will conclude that she shares similar values. On the other hand, if she comes to realise that the current distribution of pay is not in line with her fairness beliefs, she will conclude that her values and those of the organisation/workplace are incongruent. The latter case will indicate the employee untrustworthiness of those responsible for the distribution of pay, namely the managers, whilst the former case of shared values will suggest trustworthy behaviour of the manager in areas beyond pay matters. I thus expect:

Hypothesis 2c: Shared values mediate the relationship between perceived managers fairness and employee trust in managers.

The described serial mediation is pictured in figure 8 on the next page.

Figure 8: Serial mediation relationship



4.6 Methodology

4.6.1 Data sample

For the analysis in this chapter, I used the same data sample as in Chapter 3. It differs only in the additional variables and model estimations for the two proposed mediators, which are described below.

In respect to the inclusion of sampling weights, I follow a slightly different process in this chapter. I will first run regressions for the unweighted sample. As regression results for the weighted complete sample did not suggest a significant relationship between intra-workplace pay inequality and employee trust in managers, there is no further need to test for the mediating relationship. Instead, I will only test for the mediating role of perceived manager fairness and shared values for the weighted sub-sample of medium and large workplaces, as only these, next to the unweighted sample, produced significant results for the direct relationship.

4.6.2 Measurements

In addition to the measures in the previous empirical chapter, the two mediators, employees' perception of manager fairness and employees' perception of shared values were added.

Mediator: Employee fairness perceptions

To capture perceived manager fairness, I used the item "Manager here treat employees fairly" from the SEQ. By focusing on how fair employees perceive to be *treated*, this one-item five-point Likert-type scale measures a dimension of fairness that fits well to the theoretical model of this PhD research. Adams (1965) argues that equity considerations influence the perceptions of being fairly treated in the social exchange. Although this item is quite broad in that it does not specify the aspect this fair treatment relates to, this ambiguity resonates more closely to the overall rating of the social exchange between managers and employees, wherein equity theory is located. Admittedly, established organisational fairness measures for this dimension are based on multiple items (Colquitt et al., 2001). Yet, the broadness of the one-item measure used in this research captures the employee's overall impression of managers' fairness well. As already stressed in Chapter 2, a compromise had to be made between sample size, representativeness, multilevel design and the degree of measurement validity.

Mediator: Shared Values

An employee's perception of shared values was measured by a one-item five-point Likert-type scale from the SEQ: "I share many of the values of my organisation". The five-point scale

ranged from “strongly agree” to “strongly disagree”. As this research is not interested in how different value *orientations* relate to perception of inequality fairness or trustworthy managers, established value scale such as the Rokeach Value Survey (1973) or the Schwartz Value Survey (1992) are not needed for the testing of hypotheses 2c. Instead, the aforementioned direct question is sufficient in testing if and how inequality and fairness relate to the employee’s perception of *shared* values – whatever these values might be – and if and how shared values affect trust. The open nature of the one-item measure of shared values focuses on the employee’s view on value incongruence “representing the range of beliefs held by its members regarding the set of values that should be the basis for its [the organization’s] behaviours and actions” (Bourne and Jenkins, 2013: 502). There is a vast range of organizational values due to the different forms they can take (Badovich and Beatty, 1987; Bourne and Jenkins, 2013). Proposing a limited number of values would thus fall short of capturing the complexity of the construct. This broad measure captures the essence of the aim of this research: the relationship between intra-workplace pay inequality, fairness perceptions, and shared values as a sign of stratification.

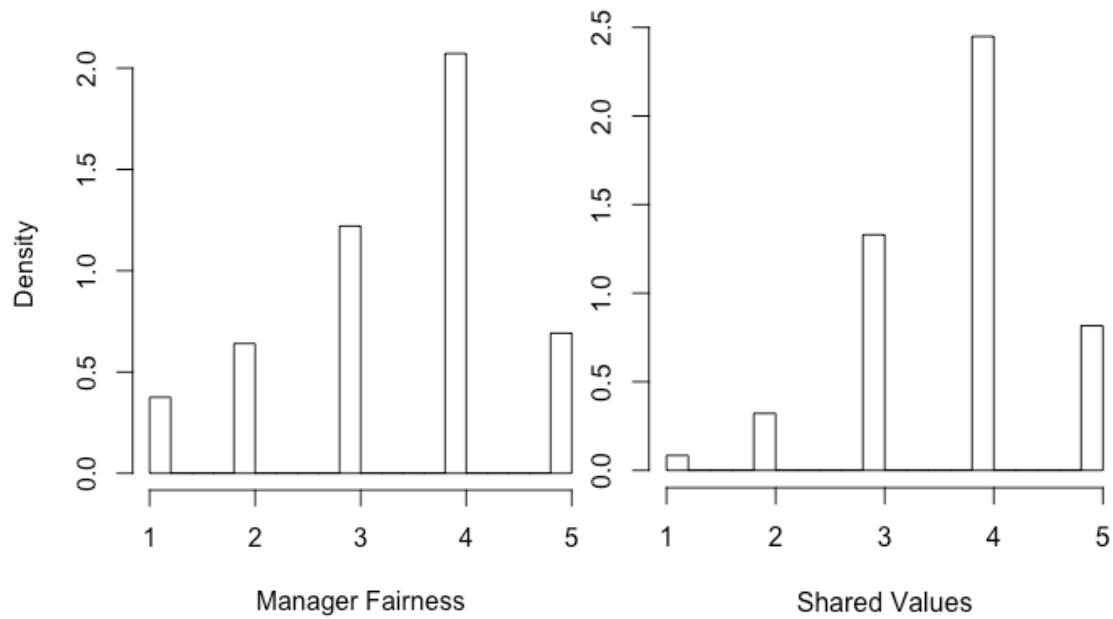
Summary statistics for the two mediators using the unweighted sample can be found in table 8 and histograms for the two measures in figure 9 below. With a mean value of 3.39, perceived manager fairness is on average slightly higher than employee trust. Using a sample with original level 1 weights, the mean value equals 3.47, and 3.41 for the sample using rescaled level 1 weights. Moreover, the mean value of shared values (3.71) signals that, on average, employees tend to share organisational values. For the sample using original level 1 weights and for sample using the rescaled level 1 weights, the mean value is 3.72. Figure 9 shows how the two mediators are distributors.

Table 8: Descriptive statistics mediation model (unweighted sample)

	n	mean	sd	median	min	max	skew	kurtosis	se
Manager Fairness	13704	3.39	1.11	4.00	1	5	-0.57	-0.39	0.01
Shared Values	13616	3.71	0.87	4.00	1.00	5.00	-0.60	0.44	0.01

Note: unweighted sample

Figure 9: Histogram mediators (weighted sample using original level 1 weights)



4.6.3 Measurement model

Confirmatory factor analyses were conducted to assess the validity and reliability of the measurement model. The measurement model comprised 3 latent variables, trust, fairness and shared values. To standardize results, the variance for both manifest and latent variables was fixed at 1. Initially, a theoretical measurement model was tested wherein individual items were allowed to load on their hypothesised latent constructs. This model was then compared to alternative specifications.

As can be seen in table 9 below, the overall fit of the three-factor measurement model was good as all key indicators (CFI=0.997, TLI=0.993, RMSEA=0.042, SRMR=0.008) showed a good fit between the theoretical model and the data (Hu and Bentler, 1999) and alternative specifications fared worse than the theoretical model.

Figure 10: CFA path diagram

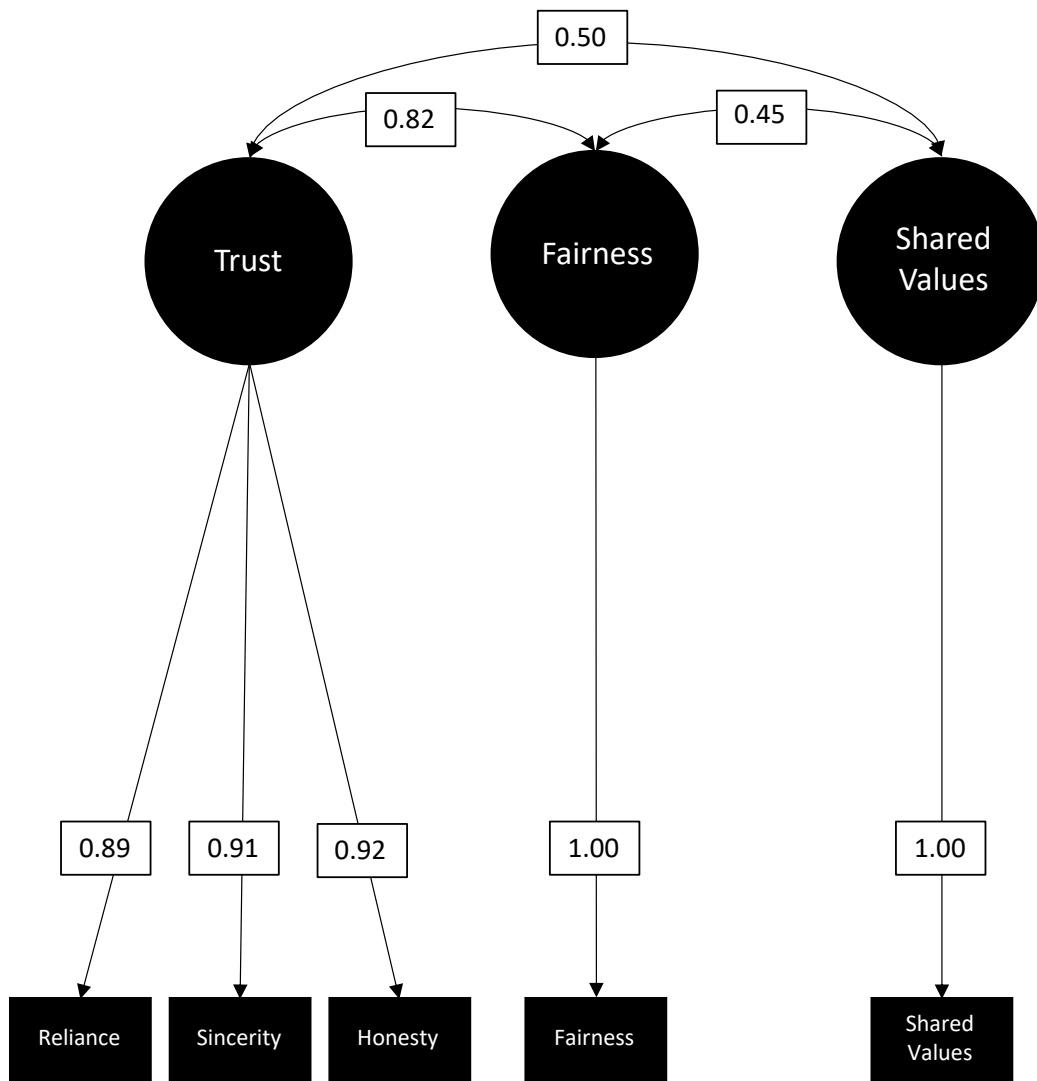


Table 9: CFA model indices

	CFI	TLI	RMSEA	SRMR
Model	0.997	0.993	0.042	0.008
Alternative 1	0.994	0.991	0.045	0.011
Alternative 2	0.991	0.984	0.056	0.012

1 = Fairness and Trust items load onto one factor
 2 = All items load onto a single factor

In a second step, I tested for the validity of the factors. Essentially, “discriminant validity is the extent to which latent variable A discriminates from other latent variables” (Farrell, 2010: 324). Discriminant validity is said to be established if the *average variance extracted* for each construct is greater than the *shared variance estimate* – the amount of variance that one

construct can explain in the other construct (squared correlation) – of the pair of latent variables. In short, if the construct can explain more variance in its own items than in the items of the other constructs, there is sufficient discriminant validity. All latent variables had sufficient discriminant validity.

4.6.4 Common Method Variance

Common method variance (CMV) refers to “the variance that is attributable to the measurement method rather than to the constructs the measure presents.” (Podsakoff et al., 2003: 879). Put differently, a predicted relationship between two constructs might only be detected because of the respondents’ reported (biased) answers rather than due to a “true” underlying relationship. An observed correlation between two variables consists, hence, of three components: a true correlation, a correlation due to common method variance and a random error (Doty and Glick., 1998).

There is a possibility of common method variance in the data given that trust, fairness, shared values were measured by Likert-type scales at employee-level (Podsakoff et al., 2003). We used Lindell and Whitney’s (2001) marker variable test to check for common method variance. The marker should be a variable that is theoretically unrelated to the outcome variable, i.e. an item that bears not theoretical link to a manager’s perceived trustworthiness. The following variable was used as a marker: “*How well do the work skills you personally have match the skills you need to do your present job?*”. Feeling under- or over-qualified should not be related with the perceived trustworthiness of one’s manager. Several conditions need to be fulfilled. First, the relevant predictors should be significantly correlated with the outcome variable, whereas the marker variable should have a non-significant correlation that tends towards zero. Essentially, we are using the marker variable to calculate a partial correlation, which captures the relationship between the outcome variable and the predictor variables, controlling for the CMV. It follows that, second, if the correlations between the predictor variable and the outcome variable remain significant after the partialling-out, “this suggests that the results cannot be accounted for by CMV” (Lindell and Whitney, 2001: 118)

As can be seen in Table 10 below, the correlation between the marker variable and the outcome items is the lowest (0.02) among all correlations between the outcome and other study variables. Although the correlation coefficient was statistically significant for four out of six

items, this is not uncommon as p-values are generally low in large samples such as the WERS. The main takeaway from the marker variable test is that the marker variable bears no meaningful correlation with the items of interest; ranging from as little as 0.01 to no higher than 0.04. Hence, the element of the observed correlation stemming from CMV is relatively small.

Table 10: Correlation matrix of latent variable items with marker variable

	Marker	Shared Values	Reliance	Sincerity	Honesty	Fairness
Marker	1					
Shared Values	0.01	1				
Reliance	-0.02***	0.27***	1			
Sincerity	-0.02*	0.29***	0.67***	1		
Honesty	-0.03***	0.28***	0.61***	0.70***	1	
Fairness	-0.04***	0.28***	0.56***	0.62***	0.61***	1

*Note: * p < 0.05; ** p < 0.01; *** p < 0.001;*

After partialling-out the effect of the marker (see Lindell and Whitney, 2001), the correlation between all criterion variables marginally decreased, yet they are still statistically and *quantitatively* significant (table 11). This shows that even after controlling for CMV the true correlation between the criterion and the outcome variables that are measured by the same type of scale is still strongly positive and significant.

Table 11: Partial correlation matrix

	Reliance	Sincerity	Honesty
Reliance	1		
Sincerity	0.66***	1	
Honesty	0.60***	0.69***	1
Fairness	0.54***	0.60***	0.59***
Shared Values	0.24***	0.26***	0.25***

*Note: * p < 0.05; ** p < 0.01; *** p < 0.001*

The marker method has been criticised on conceptual grounds for failing to account for some of the most powerful forms of CMV such as social desirability and implicit theories, as it a) is hard to imagine that a completely unrelated item would be related to behavioural predictor, and b) assumes that the common method factor represented by the marker variable “has exactly the same impact on all of the observed variables” (Lindell and Whitney, 2001:

116). Nevertheless, as the most probable cause of CMV in the case of the WERS is related to common scale format, choosing an unrelated marker variable that is measured in the same way as the variable of interest, offers a valid way of testing this particular form of CMV.

4.6.5 Statistical approaches

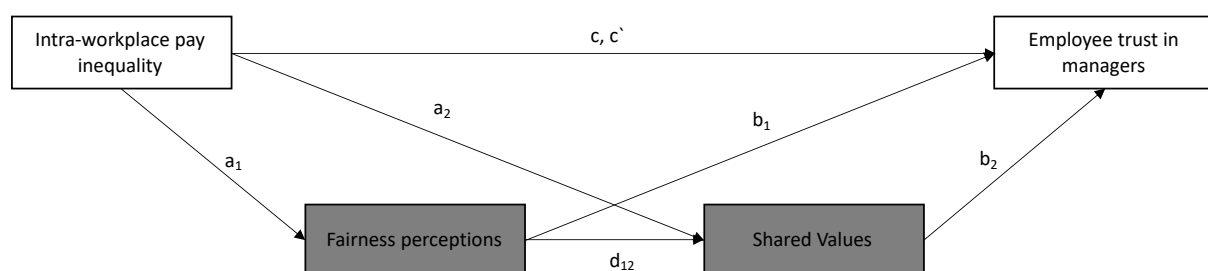
As in the previous chapter, I employed two different models to test the mediating role of perceived fairness and shared values in the relationship between intra-workplace pay inequality and employee trust in managers: a multilevel (serial) mediation effect model and a random forest model.

4.6.5.1 Multilevel mediation model

As in the previous chapter, I employed a random intercept model.

The mediation model in line with Baron and Kenny (1986) is depicted in Figure 11 below. This is a 2-1-1-1 mediation model, given pay inequality was measured at level two (workplace) while other variables in the model were measured at the employee level. The serial mediation in the relationship between pay inequality and employee trust, going from pay inequality first through fairness and then through shared values, is similar to the aforementioned model by Baron and Kenny (1986) but includes a second mediation relationship (see figure 10 below).

Figure 11: Serial mediation model



In line with the multilevel model on the direct effect between pay inequality and employee trust in managers, I ran the mediation models with the full maximum likelihood estimator.

Taken together, equations 8 to 10 represent the essential steps of the classic mediation analysis and equations 11 to 12 the steps of the serial mediation.

$$Trust_{ij} = \gamma_0 + \gamma Pay\ Inequality_j + \varphi X_{ij} + \varpi W_j + u_{0j} + e_{ij} \dots\dots\dots Eq\ (8)$$

$$Perceived\ Fairness_{ij} = \gamma_0 + \gamma Pay\ Inequality_j + \varphi X_{ij} + \varpi W_j + u_{0j} + e_{ij} \dots\dots\dots Eq\ (9)$$

$$Trust_{ij} = \gamma_0 + \theta Perceived\ Fairness_{ij} + \gamma Pay\ Inequality_j + \varphi X_{ij} + \varpi W_j + u_{0j} + e_{ij} \dots\dots Eq\ (10)$$

$$Shared\ Values_{ij} = \gamma_0 + \theta Perceived\ Fairness_{ij} + \gamma Pay\ Inequality_j + \varphi X_{ij} + \varpi W_j + u_{0j} + e_{ij} \dots\dots Eq\ (11)$$

$$Trust_{ij} = \gamma_0 + \rho Shared\ Values_{ij} + \theta Perceived\ Fairness_{ij} + \gamma Pay\ Inequality_j + \varphi X_{ij} + \varpi W_j + u_{0j} + e_{ij} Eq\ (12)$$

Where,

$\gamma_0 + u_{0j}$ = an intercept corresponding to workplace j (γ_0 - average intercept)

γ = regression coefficient for the effect of pay inequality

θ = regression coefficient for the effect of fairness perception

ρ = regression coefficient for the effect of shared values

X_{ij} = person specific control variables

W_j = workplace specific control variable

e_{ij} = error term

4.6.5.2 Random Forest Model

The random forest model used in the previous empirical chapter was extended by the two mediators, perceived manager fairness, and shared values. Arguing in favour of a non-linear relationship between intra-workplace pay inequality and perceived manager fairness, as well as for a positive linear relationship between a) perceived fairness and shared values, and b) shared values and employee trust in managers, random forest models, and their visualising through PDP plots are able to suggest if the hypothesis can be supported. To test these predictions, I will run three separate models for each pay inequality measure.

4.7 Results

4.7.1 Multilevel mediation model

The mediating role of fairness perceptions

Hypothesis 2a predicted that an employee's fairness perceptions mediate the relationship between pay inequality and employee trust in managers. The results in table 12 and 13, showing results for the unweighted full sample, support this hypothesis.

Table 12: Regression results for the mediating role of perceived manager fairness for the Gini coefficient – trust in managers relationship (unweighted sample)

	Trust (1)	Fairness (2)	Fairness (3)	Trust (4)
Perceived manager fairness				0.689*** (0.005)
Gini coefficient	0.600*** (0.172)	0.380** (0.180)	0.212 (0.678)	0.151* (0.090)
Gini coefficient ²			0.821 (1.861)	
Constant	3.815*** (0.075)	3.936*** (0.082)	3.895*** (0.095)	1.176*** (0.048)
Observations (Employees)	11,940	12,143	12,159	11,874
Observations (Workplaces)	1,603	1,603	1,603	1,603
R ² (Level 1)	0.077	0.074	0.062	0.642
R ² (Level 2)	0.116	0.083	0.088	0.015

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

All regressions include control variables

Based on unweighted sample

Table 13: Regression results for the mediating role of perceived manager fairness for the coefficient of variance – trust in managers relationship (unweighted sample)

	Trust (1)	Fairness (2)	Fairness (3)	Trust (4)
Perceived manager fairness				0.692*** (0.005)
Coefficient of Variance	0.298*** (0.094)	0.208** (0.099)	0.533 (0.364)	0.118** (0.049)
Coefficient of Variance ²			-0.404 (0.435)	
Constant	3.808*** (0.078)	3.884*** (0.084)	3.823*** (0.106)	1.176*** (0.048)
Observations (Employees)	11,940	12,159	12,159	11,874
Observations (Workplaces)	1,603	1,603	1,603	1,603
R ² (Level 1)	0.077	0.074	0.062	0.642
R ² (Level 2)	0.116	0.083	0.088	0.015

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

All regressions include control variables

Based on unweighted sample

All required steps for a successful mediation are fulfilled. Both the direct association between the Gini coefficient and trust and the association between the Gini coefficient and perceived manager fairness are positive and significant. Moreover, after including perceived of manager fairness when regressing trust on the Gini coefficient, the relationship between fairness and trust was statistically significant ($\beta=0.69$, $p\text{-value} < 0.001$) while the effect of the Gini coefficient diminished in size and only remained significant at a 10-per cent level ($\beta=0.151$, $p\text{-value}=0.093$). Moreover, including perceived manager fairness in the model increased the R^2 from around 0.2 to 0.65. However, regression coefficients in column (3) suggest that there is no curvilinear relationship between intra-firm pay inequality and an employee's fairness perceptions. Instead, as in the previous chapter, using traditional regression methods suggests a positive relationship between pay inequality and perceived manager fairness. Results for the coefficient of variance (table 13) are in line with those for the Gini coefficient. The result from the linear unweighted regression model thus support hypothesis 2a, but do not support hypothesis 2b.

Considering that only the rescaled weighted regression models for the subsample of medium and large workplaces suggested a significant and positive relationship between pay inequality and employee trust, the mediation analysis was only performed on the sub-sample. Table 14, 15, 16 and 17 show regression results for the sub-sample of medium and large workplaces with rescaled weights using method A and B, respectively. Both scaling method produce the exact same regression results. They suggest a significant and positive relationship between the Gini coefficient and perceived manager fairness at a 5-per cent level (table 14 and 15). Moreover, when adding perceived manager fairness to the regression model, the effect size of the Gini coefficient decreases and turns non-significant. Whilst regression results in table 16 and 17 for the coefficient of variance as measure of pay inequality also suggest a statistically significant mediation, this time the effect of pay inequality on perceived manager fairness is not positive but inversely U-shaped.

Table 14: Regression results for the mediating role of perceived manager fairness for weighted subsample of medium and large enterprises using scaling method A

	Fairness (1)	Fairness (2)	Trust (3)
Perceived manager fairness			0.677*** (0.011)
Gini coefficient	0.768** (0.329)	1.950* (1.110)	0.226 (0.159)
Gini coefficient ²		-3.298 (2.991)	
Constant	3.950*** (0.082)	3.865*** (0.175)	1.172*** (0.100)
Observations (Employees)	8,343	8,343	8,343
Observations (Workplaces)	938	938	938
R ² (Level 1)	0.074	0.062	0.642
R ² (Level 2)	0.083	0.088	0.015

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

All regressions include control variables

Based on sub-sample with rescaled weights
method A

Table 15: Regression results for the mediating role of perceived manager fairness for weighted subsample of medium and large enterprises using scaling method B

	Fairness (1)	Fairness (2)	Trust (3)
Perceived manager fairness			0.677*** (0.011)
Gini coefficient	0.768** (0.329)	1.950* (1.110)	0.226 (0.159)
Gini coefficient ²		-3.298 (2.991)	
Constant	3.950*** (0.082)	3.865*** (0.175)	1.172*** (0.100)
Observations (Employees)	8,343	8,343	8,343
Observations (Workplaces)	938	938	938
R ² (Level 1)	0.074	0.062	0.642
R ² (Level 2)	0.083	0.088	0.015

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

All regressions include control variables

Based on sub-sample with rescaled weights
method B

Table 16: Regression results for the mediating role of perceived manager fairness for weighted subsample of medium and large enterprises using scaling method A – coefficient of variance

	Fairness (1)	Fairness (2)	Trust (3)
Perceived manager fairness			0.678*** (0.011)
Coefficient of variance	0.246 (0.189)	1.768** (1.110)	0.074 (0.298)
Coefficient of variance ²		-1.821** (2.991)	0.086 (0.304)
Constant	3.990*** (0.167)	3.708*** (0.199)	1.167*** (0.115)
Observations (Employees)	8,343	8,343	8,343
Observations (Workplaces)	938	938	938
R ² (Level 1)	0.074	0.062	0.642
R ² (Level 2)	0.083	0.088	0.015

*Note: *p<0.1, **p<0.05, ***p<0.01*

All regressions include control variables

Based on sub-sample with rescaled weights
method A

Table 17: Regression results for the mediating role of perceived manager fairness for weighted subsample of medium and large enterprises using scaling method B – coefficient of variance

	Fairness (1)	Fairness (2)	Trust (3)
Perceived manager fairness			0.678*** (0.011)
Coefficient of variance	0.246 (0.189)	1.768** (1.110)	0.074 (0.298)
Coefficient of variance ²		-1.821** (2.991)	0.086 (0.304)
Constant	3.990*** (0.167)	3.708*** (0.199)	1.167*** (0.115)
Observations (Employees)	8,343	8,343	8,343
Observations (Workplaces)	938	938	938
R ² (Level 1)	0.074	0.062	0.642
R ² (Level 2)	0.083	0.088	0.015

*Note: *p<0.1, **p<0.05, ***p<0.01*

All regressions include control variables

Based on sub-sample with rescaled weights
method b

The results thus suggest that perceived manager fairness mediates the relationship between intra-workplace pay inequality and employee trust in managers in medium and large workplaces. Whilst the results suggest a mostly positive association between pay inequality and perceived manager fairness, for the coefficient of variance and the weighted sub-sample of medium and large workplaces, the relationship is, in line with hypothesis 2b, suggested to be inversely U-shaped.

The mediating role of shared values

The results in table 18 show that all steps for a successful partial serial mediation are fulfilled for the full sample without sampling weights. The Gini coefficient has a significant and positive effect on shared values ($\beta=0.506$, $p\text{-value}=0.003$). Fairness perceptions partially mediate the relationship between pay inequality and shared values, in that fairness perceptions have a significant relationship with shared values at a 0.1 per cent level ($\beta=0.311$, $p\text{-value}=0.00$), whilst the effect of the Gini coefficient on shared values decreases ($\beta=0.335$, $p\text{-value}=0.005$). When regressing trust on all three variables – shared values, fairness perceptions and the Gini coefficient – the effect of the Gini coefficient becomes non-significant ($p\text{-value}=0.16$), the effect size of perceived fairness decreases slightly ($\beta=0.640$), and shared values are associated positively and at a 0.1 per cent significance level ($p\text{-value}=0.00$) with employee trust in managers. These results partly support hypotheses 2c.

Including shared values increased the R^2 of the model slightly from 0.65 to 0.67.

Table 18: Regression results for the mediating role of shared values for full sample without sampling weights

	Trust (1)	Shared Values (2)	Shared Values (3)	Trust (4)
Shared Values				0.167*** (0.007)
Perceived Manager Fairness	0.689*** (0.011)		0.311*** (0.007)	0.640*** (0.005)
Gini coefficient	0.151* (0.011)	0.506*** (0.139)	0.335*** (0.119)	0.123 (0.087)
Constant	1.176*** (0.048)	3.887*** (0.063)	2.691*** (0.082)	0.708*** (0.051)
Observations (Employees)	11,874	12,078	11,960	11,720
Observations (Workplaces)	1,603	1,598	1,597	1,597
R ² (Level 1)	0.642	0.095	0.246	0.659
R ² (Level 2)	0.015	0.08	0.043	0.015

Note: control variables included; * p ** p *** p<0.01

The results for the weighted samples of medium and large workplaces are displayed in tables 19 and 20 on the next page. In line with the results from the unweighted regression using the full sample, all steps for a significant partial mediation are fulfilled.

Table 19: Regression results for the mediating role of shared values for weighted subsample of medium and large enterprises using scaling method A

	Trust (1)	Shared Values (2)	Shared Values (3)	Trust (4)
Shared Values				0.175*** (0.097)
Perceived Manager Fairness	0.689*** (0.005)		0.300*** (0.014)	0.625*** (0.013)
Gini coefficient	0.151* (0.090)	0.567** (0.232)	0.059 (0.181)	0.211 (0.154)
Constant	1.176*** (0.048)	3.534*** (0.098)	2.612*** (0.141)	0.713*** (0.097)
Observations (Employees)	8,343	8,343	8,343	8,343
Observations (Workplaces)	938	938	938	938

Note: control variables included; * ** p *** p<0.01

Table 20: Regression results for the mediating role of shared values for weighted subsample of medium and large enterprises using scaling method B

	Trust (1)	Shared Values (2)	Shared Values (3)	Trust (4)
Shared Values				0.175*** (0.097)
Perceived Manager Fairness	0.689*** (0.005)		0.300*** (0.014)	0.625*** (0.013)
Gini coefficient	0.151* (0.090)	0.567** (0.232)	0.059 (0.181)	0.211 (0.154)
Constant	1.176*** (0.048)	3.534*** (0.098)	2.612*** (0.141)	0.713*** (0.097)
Observations (Employees)	8,343	8,343	8,343	8,343
Observations (Workplaces)	938	938	938	938

Note: control variables included; * ** p *** p<0.01

Results from the MLM mediation analysis suggest that fairness perceptions mediate the relationship between intra-workplace pay inequality and employee trust in managers. As with the direct relationship, results from the weighted and unweighted regression analysis suggest, that the effect applies to medium and large workplaces. Yet, MLM do not offer support for the hypothesised inversely U-shaped relationship between pay inequality and perceived manager fairness.

4.7.2 Random Forest Model

In line with the structure used in the previous empirical chapter for the random forest model, first importance scores will be presented before turning to the PDP plots that visualise the relationship between the intra-workplace pay inequality and the two mediators.

Results for the importance score in table 21, show that a) the importance of intra-workplace pay inequality for predicting trust decreases when including the mediators, and b) intra-work pay inequality is a predictor of perceived manager fairness.

Table 21: Variable importance score including mediators

	Employee trust in managers					Perception of fairness	
	Variable importance (permutation importance)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Gini	21.33	-	13.73	-	6.99	11.43	-
Coefficient of variance	-	19.66	-	13.00		-	17.77
Perception of fairness	-	-	172.52	179.60	154.78	-	-
Shared Values					36.88		
Number of trees	500	500	500	500	500	500	500
Number of variables tried at each split	3	3	3	3	3	3	3
Mean-squared residuals	0.919	0.925	0.358	0.357	0.340	1.167	1.087

Sample size: test data, $N=2145$ worker observations. Controls included

Hypothesis 2 predicted that fairness perceptions mediate the relationship between intra-workplace pay inequality and employee trust in managers. Specifically, I argued that the pay inequality-fairness perceptions relationship ought to be curvilinear, and that the relationship between fairness perceptions and trust is positive. Partial dependence plots in figures 12 and 13 are generally supportive of the hypothesis. The PDP for the Gini coefficient – fairness relationship (figure 12) shows a positive association up until a Gini coefficient of around 0.25, after which the association turns negative. These findings suggest a curvilinear relationship between intra-workplace pay inequality and fairness perception. In other words, at low levels of pay inequality, further increases are related to more manager fairness. Yet, once pay inequality passes this threshold, any further increases are associated with less perceived manager fairness. Similar results are found for the relationship between the coefficient of variance and fairness perception (figure 13). On the other hand, the link between fairness

perception and trust (figure 14) is almost perfectly linear, where a 1-point increase in fairness perception is approximately associated with 0.5 increase in employee trust in managers.

Results from the random forest analysis on the relationship between fairness perceptions, shared values and employee trust are in line with results from the traditional regression model. Figures 15 and 16 suggest that the relationship between both fairness and shared values, and between shared values and employee trust are positive. This means that higher perceptions of manager fairness are associated with a higher degree of shared values, which in turn are related to more trust in managers. This supports hypothesis 2a and 2c.

Figure 12: PDP (Gini coefficient – fairness)

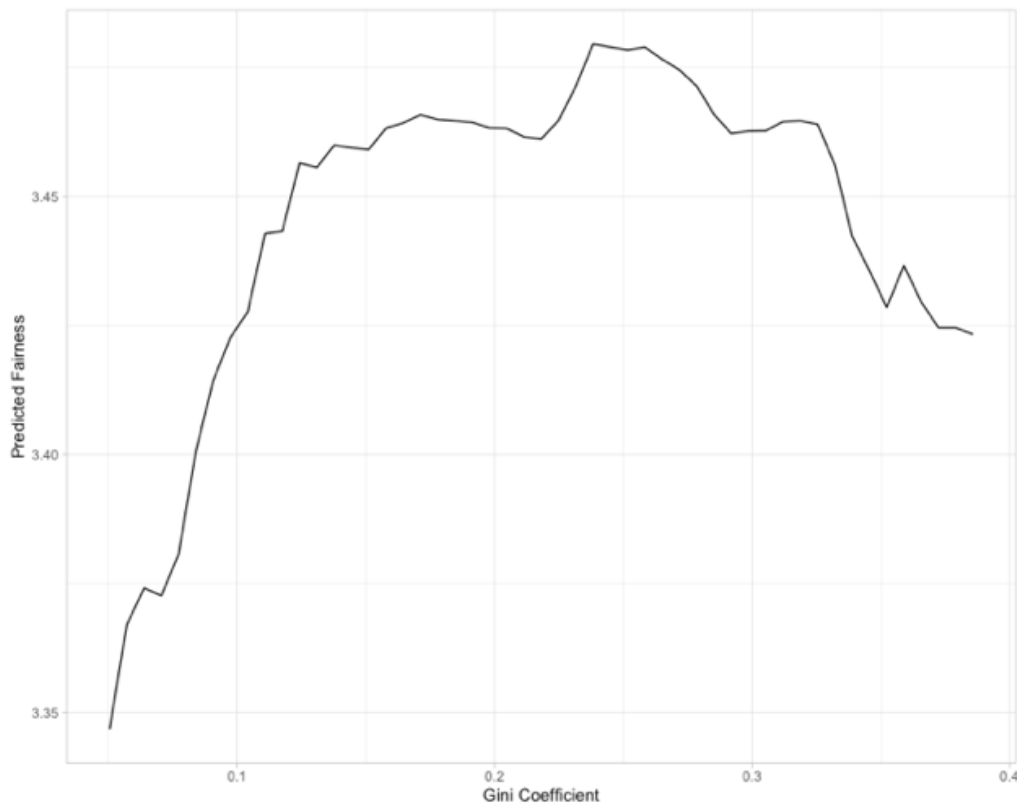


Figure 13: PDP (Coefficient of variance – fairness)

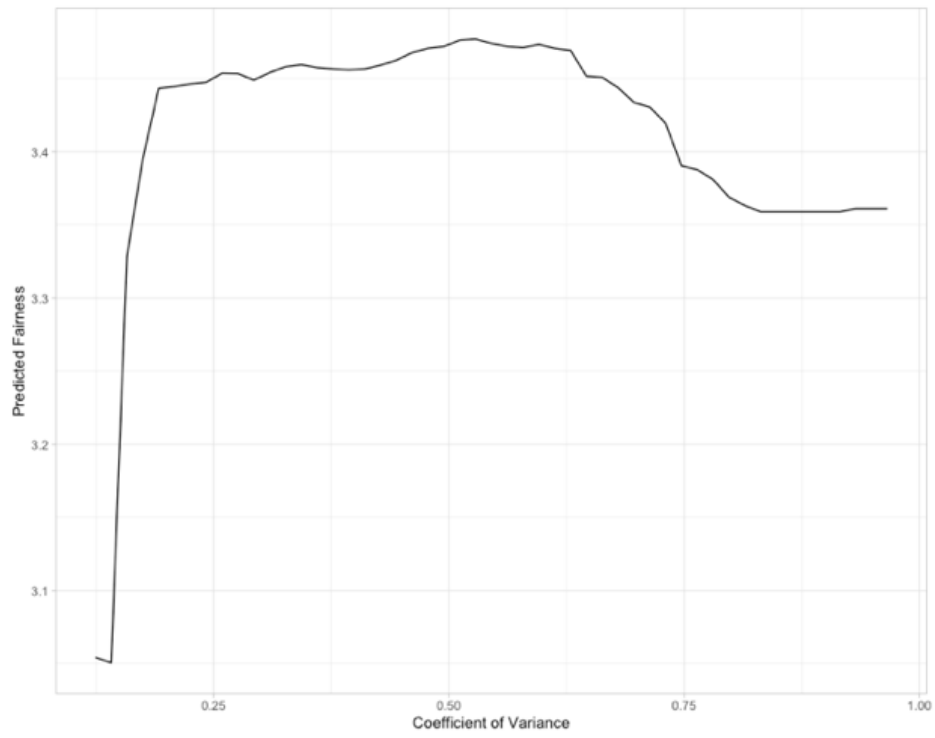


Figure 14: PDP (fairness – trust)

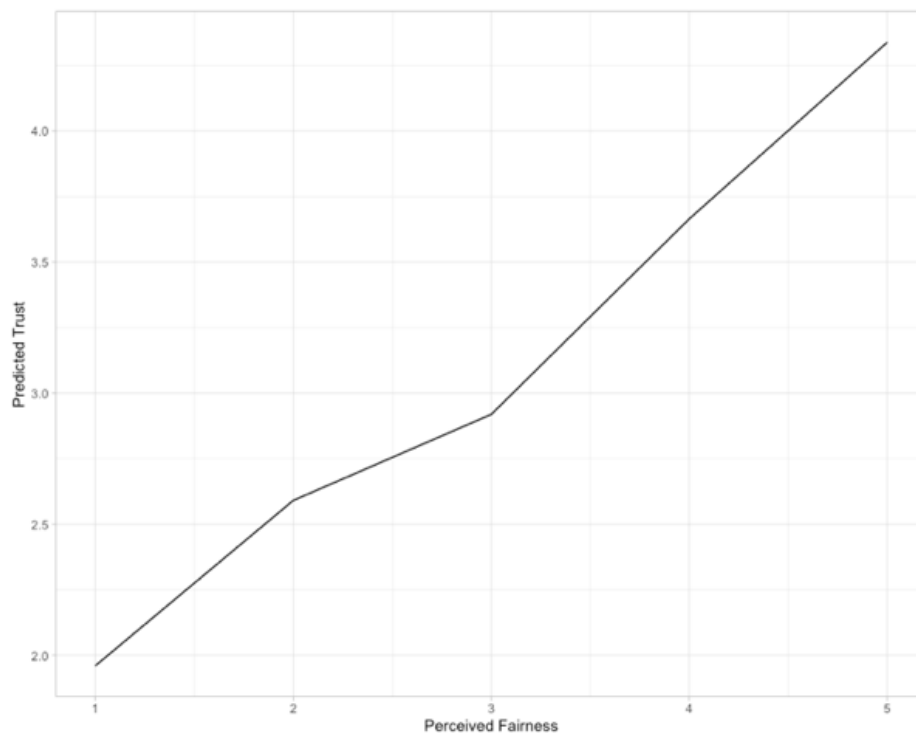


Figure 15: PDP (fairness – shared values)

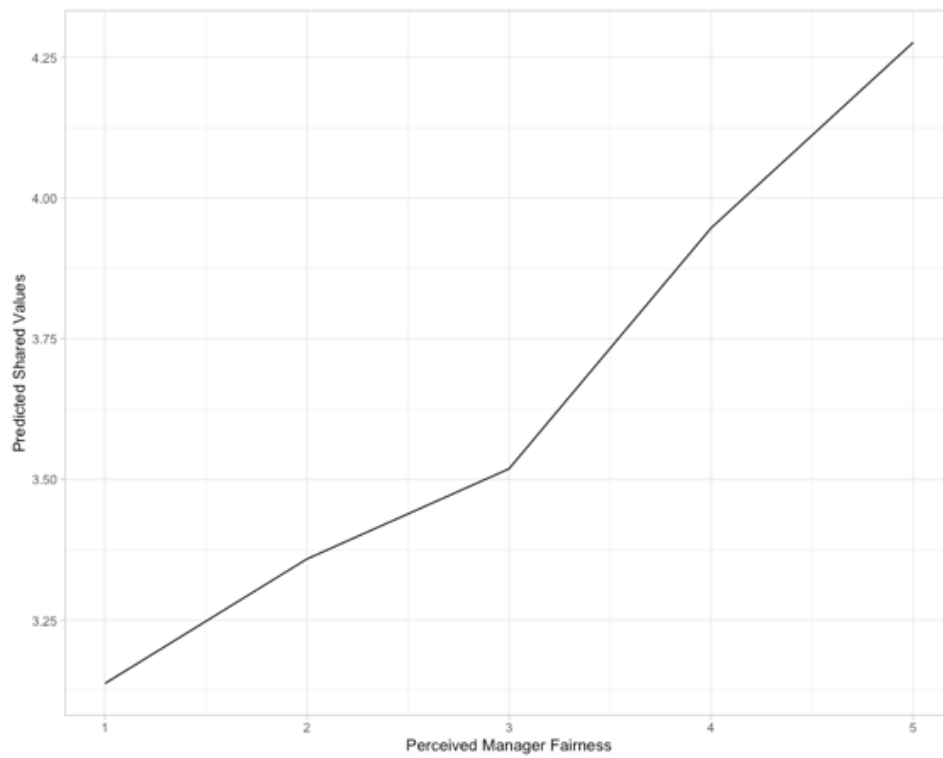
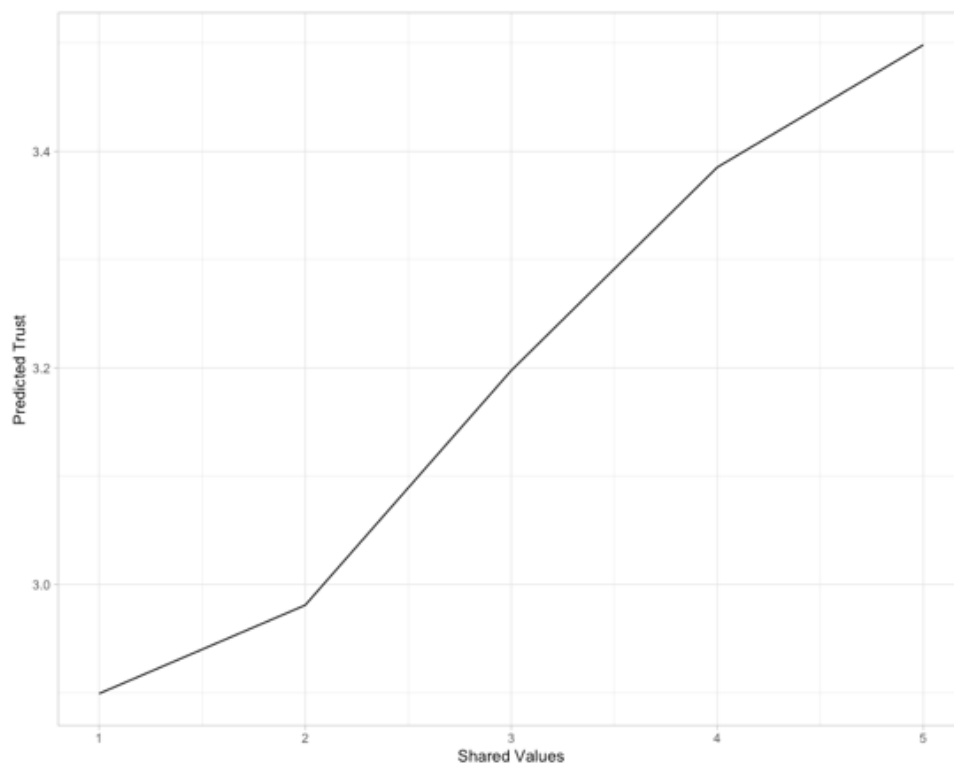


Figure 16: PDP (shared values - trust)

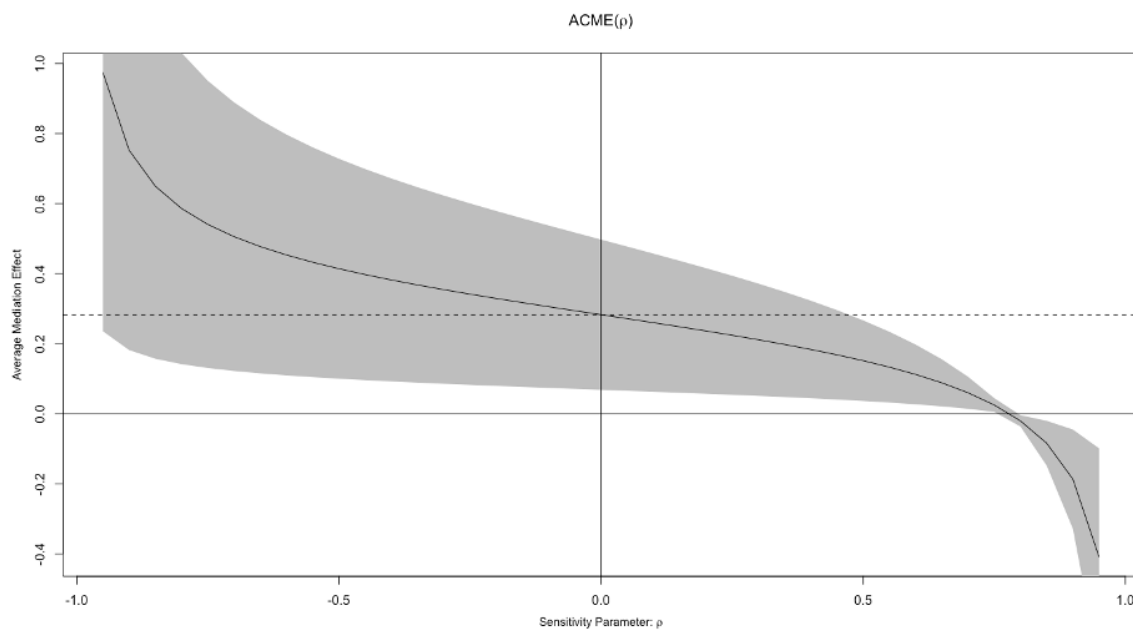


4.8 Sensitivity Analysis

In light of the cross-sectional nature of the data in this research, it is neither possible to make causal claims about the direction of the mediation, because the results cannot say anything about temporal sequences, nor to eliminate omitted variables bias completely. Nevertheless, there are options available to increase the robustness of the findings by conducting sensitivity analyses on how likely it is that the sequential ignorability assumption was violated in the mediator-outcome relationship. As the assumption posits that there are omitted confounders along each step of the causal chain (Imai et al., 2010), the sensitivity function by Imai et al. (2010) used here quantifies the violation of the assumption by calculating the true average mediated effect at different levels of a sensitivity parameter ‘rho’, which can take values ranging from -1 to +1. The higher the absolute value of the parameter rho at which there is still a true mediated effect, the stronger the established mediated relationship. Next to the sensitivity parameter, the analysis indicates how much of the proportion of variance of the mediator and outcome variable must be explained by an unobserved, i.e. omitted, confounding variable for the mediation effect to turn zero with 95 per cent probability.

The results of the sensitivity analysis suggest that ‘rho’ is 0.8, indicating a relatively strong established mediated relationship. This is illustrated in figure 17. The second indicator for robustness, the product of R² coefficients for the outcome and mediation regression with a confounding variable at which the average effect of the mediation turns zero, was equal to 0.64. In other words, in order to cancel out the found mediation effect in my model, an omitted confounding variable would need to explain 80 per cent of the variance of perceived manager fairness and 80 per cent of the variance of employee trust in managers. Theoretically this is not impossible. Yet, in practice it is unlikely that this is going to materialise. Whilst these results increase the robustness of the findings of the mediation effect of fairness, they can only be seen as indicators for the three-way relationship between the three variables intra-workplace pay inequality, fairness perceptions, and employee trust in managers. Without longitudinal data or experimental evidence, I will refrain from making any stronger causal claims.

Figure 17: Sensitivity analysis plot for mediation effect of perceived fairness



4.9 Discussion

This chapter set out to provide some empirical answers in regard to the underlying mechanisms for the pay inequality – trust in managers relationship; something that has received less attention in the income inequality – trust literature. Probing into the potential theoretical explanations for the inversely U-shaped relationship found in the Chapter 3 helps to improve the potential implications drawn from this research project.

In line with the country level literature, I tested the perception of inequality effect and the stratification effect. Though contrary to previous studies, I did not treat these theoretical explanations as mutually exclusive but rather as related phenomena. As hypothesised, fairness perceptions mediated the association between intra-workplace pay inequality and employee trust in managers. More specifically, the relationship between pay inequality and fairness perceptions follows an inverted U-shape, closely mirroring the relationship between inequality and trust shown in the previous chapter. And shared values partially mediated the relationship between fairness perceptions and employee trust in managers. Findings apply to the full unweighted sample and the weighted sample of medium and large workplaces. The established mediated relationship was found to be robust against violations of the sequential ignorability assumption. Implications of these findings for theory and practice are discussed below.

4.9.1 Theoretical Implications

The mediating role of fairness perceptions for the inequality – trust relationship

The findings are generally supportive of equity theory's (Adams, 1965) prediction on the inherent role of fairness perceptions when judging pay inequality. Yet, rather than confronting employees with scenarios where they can clearly observe inputs and outcomes as, for instance, Shore et al. (2006), Summers and DeNisi (1990), Sweeney and McFarlin (2005) have done, this PhD has established a connection to actual levels of pay inequality. This is an important contribution because it reflects the inherent uncertainty, non-transparency and the subjectivity of inputs and outcomes in real life situations (Van den Bos, 2005; Van den Bos et al., 1999).

The importance of fairness perceptions in understanding people's reaction to pay inequality found in this PhD research is in line with both neurological and economic research. Guo et al. (2014) found that emotional reactions in the brain are not triggered by income inequality per se but rather by the unfairness that people associate with certain levels of inequality. Similar conclusions reached by Cappelan et al. (2020), Almås et al. (2020) and Starvas et al. (2017) suggest that people are not interested in actual income inequality, but rather in its potential unfairness. My findings are in line with this macro level evidence and extend them to the workplace level. This provides organisational level evidence for the inequality perception effect that has been proposed, yet not been empirically confirmed, in macro level studies on income inequality and trust (see for instance Uslaner and Brown, 2005; Steijn and Lancee, 2011; Stephany, 2017). In other words, this research has shown that fairness perceptions function as an underlying mechanism for the relationship between pay inequality and employee trust in managers. This implies that objective levels of pay, or income inequality are only likely to matter if they are perceived as unfair. However, due to the cross-sectional nature of the data used, future research needs to confirm these findings using longitudinal or experimental data, and statistical techniques that allow for causal inference.

In line with equity theory, this research suggests that employees judge the fair treatment of the social exchange with their managers in terms of the distribution of pay. By receiving a fair pay for her work, which she judges by comparing her pay and inputs to other employees, an employee will feel that her manager treated her fairly in their social exchange relationship at the workplace. The fair treatment within a social exchange is judged by the interaction between managers and employees, which should be based on equitable treatment. This would imply that employees actually view their managers responsible for pay decisions, that is, they attribute

the (un-)fairness in pay inequality to managers. From this perspective, the relationship between distributive and interactional fairness functions in two ways. On the one hand, as Bies (1987), Blodgett et al. (1997) and Steche and Rosser (2005) show, interactional justice moderates how employees view outcome decisions and situations, because manager could explain the pay decision thoroughly to employees, thus increasing the perception of fair treatment. On the other hand, distributive fairness judgments influence perceptions of interactional justice towards those responsible for the allocation decisions, and as a result trust. The latter aspect, and the finding of this research, thus constitutes a novel contribution to the literature on organisational justice, in particular the interplay of the different justice dimensions.

Considering that distributive fairness judgments are based on social comparison processes, the findings offer potential insights for the social comparison literature that deals with the outcomes of perceived unfairness (see for instance Cohen-Carash and Mueller, 2007; Smith et al., 1997). First, the fact that the results are found in the workplace where people have personal relationships with one another and have comparison reference groups when judging whether their pay is fair gives substance to Stephany's (2017) argument that the perception of inequality effect is more prominent in situations with clear reference groups rather than judging pay of strangers. Second, previous research has shown that the interaction of perceived unfairness and envy resulting from social comparison processes at the workplace result in hostile (Smith et al., 1997) and counterproductive work behaviours (Cohen-Carash and Mueller, 2007) towards the envied comparison referent. My results add to this literature by highlighting that employees who perceive to be unfairly treated do not only hold negative attitudes or feelings towards the envied person but also towards the person *responsible* for the unfair comparison outcome, in this case managers. In other words, if the locus of the comparison difference is external, thus eliciting feelings of unfairness, but can be attributed to a specific person or group of people, the negative reactions – whether internal psychological or behavioural – are likely to be directed at this person or group of people. Such a proposition is in line with findings by Skarlicki and Folger (1997) that suggest that feelings of distributive and interactional unfairness result in “adverse reactions to perceived unfairness by disgruntled employees toward their employer” (p. 434). This perspective also chimes with country level evidence on the relationship between income inequality and political trust (Belabed and Hake, 2018; Lipps and Schraff, 2020; Schäfer, 2010; Zmerli and Castillo, 2015). Zmerli and Castillo (2015), in their study on income inequality, distributive fairness perception and political trust, stress the role of attribution when they conclude that:

“... individual perceptions of distributive fairness in society exhibit a strong association with political trust. As a consequence, we infer that democratic regimes are held accountable by their citizens for the prevailing extent of inequality in a country” (p. 190)

The association between perceived fairness and trust is also in line with my findings. Yet, the measure used in my research only captured interactional forms of fairness and is thus more closely aligned to findings by Barlings and Philips (1993), Ayree et al. (2002) and Stinglhamber et al. (2006) on the relationship between interactional fairness perceptions and employee trust in supervisors and managers. Whilst these findings were based on single-workplace case studies, findings of this PhD research confirm them based on nationally representative data of UK workplaces.

Perceived fairness and shared values, trust

Adding shared values as the mediator between fairness perceptions and trust allows for some new theoretical propositions on the relationship between employees' perceptions of organisational fairness and employee trust (see for instance Alexander and Ruderman, 1987; Cohen-Carash and Spectr, 2001; Colquitt et al., 2001; DeConinck, 2010).

Previous research found distributive fairness to be associated with trust in both managers and the general management through perceived supervisory support and perceived organisational support (POS), respectively (DeConinck, 2010). DeConinck (2010: 1351) argued that a) “fairness in resource distribution will have a significant influence on POS through employees' perception that the organization cares about their welfare”, and b) that that this perception increases their view on the social exchange because it shows employees “how much the organization values their contribution” (ibid.). Mayer et al. (1995) argue that justice functions as an antecedent to trust because it signals that the party to be trusted has integrity. According to the Stanford Encyclopedia of Philosophy (Cox et al., 2017), integrity is a moral virtue, as such being a value-laden characteristic. Fairness can thus be said to signal a particular set of values the trustee perceives to be “positive”. I argue that perceived support as well as integrity are thus just a manifestation of the actual link between fairness perception and trust: the trustee's perception that the trustor holds values that the trustee also finds acceptable or admirable. Fairness is thus about shared values.

Shared values are argued to be the foundation of high-trust relationships (Fukuyama, 1995; Jones and George, 1998; Lewicki and Bunker, 1995; Rousseau et al., 1998). They suggest a level of trustworthiness that goes beyond non-affective forms of trust, such as task reliability. Trust based on shared values refers to a belief that the trustee will approach *all* situation in a way that the trustor finds acceptable (Sitkin and Roth, 1993). In these high-trust relationships, which Jones and George (1998) classify as unconditional trust, “shared values ... structure the social situation and become the primary vehicle through which those individuals experience trust” (Jones and George, 1998: 1997). The finding that shared organisational values were significantly and strongly positively associated with employee trust in managers supports theory (Butler, 1991; Fukuyama, 1995; Lewicki and Bunker, 1995; Jones and George, 1998; Mayer et al., 1995) and previous empirical evidence (Beugelsdijk and Klasing, 2016; Siegrist et al., 2000). It adds to previous findings by Beugelsdijk and Klasing (2016) who looked at generalised trust on the country level and Siegrist et al. (2000) who found that sharing an institutions values increases trust in that institution. Employees who feel or perceive to share many of values of the organisation they are employed in, find those responsible for running or acting on behalf of that institution – the managers – more trustworthy. This seems to be closest to Fukuyama’s (1995) argument that trust within a community is based on shared norms, which can both be about deep value questions, such as fairness in this case, but also about norms such as professional standards or code of behaviour.

Fairness perceptions and views on the fairness of the distribution of income or other outcomes have been shown to be based on underlying values people hold (Almås et al., 2020; Cappelen et al., 2020; Feather, 1994, 2000; Rokeach, 1973). Turning this around, if I perceive the other person to treat me fairly, this signals the trustee that the trustor must hold similar values, which in turn increases my positive expectations about future interactions (Brockner and Siegel, 1996). It follows that, since fairness views are based on values, perceiving others’ actions as fair implies that one’s own and others’ views on fairness are similar, which signals a value congruence. Admittedly, the described process might not be obvious to the trustee. It might rather happen subconsciously. Yet, the results presented in this thesis support this argument.

Relating these findings back to the original theoretical explanation of the increased social distance that inequality is said to induce under the stratification effect leads to several conclusions. For the workplace level at least, social distance resulting from inequality might

be less about the physical distance between people (Sandel, 2012) but rather about mental and cultural distance in terms of sharing the same values on, among others, questions of fairness. Contrary to the interactions on the country level, in the workplace people of different income groups do interact with one another. It might be that the top management has their own parking garage or elevator (as I have witnessed myself when working at BMW in Munich). Yet, by working for the same company, in the same workplace, employees and managers have to interact with one another and share a common identity through their workplace (Ashforth and Mael, 1989). More interaction thus does not necessarily lead to more understanding for the other party's situation and more trust. Rather, the quality of the interaction is evaluated in terms of shared values, attitudes and emotions. Just because the wealthy and less wealthy do not live in the same neighbourhoods or sit next to each other in the stadium does not mean that they do not interact. The general public might read about "the rich" in the news, on social media and hear about experiences from friends, thereby indirectly interacting and forming a picture toward these people in terms of attitudes and shared values. The wealthy even hire public relations agencies that tell them to take on philanthropic projects in an effort to boost their public perceptions. Clearly, this is not the same as meeting someone in person. The point I am trying to make, however, is that interactions can take many forms, especially in a digital age. Physical separation, one form of social distance, might be less important for our understanding of the inequality – trust relationship, than developing an understanding of shared values, and the perception of fairness. Put simply, it might be less about the number of physical contacts and more about the quality of the encounters that can take various forms.

4.9.2 Practical Implications

The results of this chapter offer important lessons to managers. Above all they suggest that managers should be aware of employees' perception of organisational fairness, here in relation to the distribution of pay and to the interactions with their managers. The identified threshold of Gini coefficient 0.25 after which the relationship between intra-workplace pay inequality and fairness perceptions turns negative can be taken as a general benchmark. Yet, as the analysis indicates the average relationship between these two phenomena, the association can differ slightly from one workplace to another. With this in mind, manager and human relations (HR) practitioners should pay more attention to their employees' fairness perceptions. First, manager can use employee-management discussions around appraisal and performance to have direct reports from their employees about the fairness of their pay, whilst simultaneously use these discussions to explain their pay decisions and the criteria used to reach them. This should

enhance employees' perceptions of international fairness which is likely to increase their distributive fairness perceptions. Second, to monitor the success of these actions, HR managers can a) include questions around fairness in employee attitude surveys, and/or b) use formal consultation channels such as works councils and trade unions.

4.10 Concluding Remarks

Fairness perceptions have been identified as underlying mechanism connecting intra-workplace pay inequality to employee trust in managers in a curvilinear pattern. Are these universal findings that apply to all types of workplaces, or might there be some confounding, workplace-contingent factors that influence the presence of the found relationships? Next to market forces of labour demand and supply (Scheidel, 2017), there are labour market institutions that affect the distribution of pay (Checci and Garcia-Peñalosa, 2008). How might these affect the intra-workplace pay inequality – employee trust in managers relationship? Keeping these questions in mind, the next empirical chapter analyses the moderating role of labour unions in the intra-workplace – employee trust in manager relationship.

Chapter 5: How labour unions can shape fairness perceptions and improve the employee-management trust relationship

The significant increase in income inequality over the last decades coincides with the decline of trade union power and collective bargaining coverage, resulting in a general shift in power from workers to employers (Atkinson, 2015). Several authors have linked the decline of collective bargaining systems to growing income inequality levels in a majority of countries (Atkinson, 2015; Card et al., 2004, 2013b; Förster and Tóth., 2015; Visser and Checchi, 2011). Card et al. (2013) found clear empirical evidence for increasing inequality in workplaces that opted out of collective bargaining systems as opposed to those where most pay is determined through collective bargaining.

Labour unions have not only shown to reduce income inequality on the macro (Atkinson, 2014; Piketty, 2014; Stiglitz, 2015) and organisational level (Card et al., 2013; Metcalf et al., 2001), by raising pay for employees covered by collective bargaining agreements (Forth and Millward, 2002), but also to establish transparency and procedural fairness through collective bargaining agreements (Kaufman, 2005). Brown et al. (2001: 25) summarise this well by arguing that “the decline of collective bargaining and of trade unions has had profound consequences for the structure of pay and the depth of wage inequality” (Brown et al., 2001: 35). Considering the influence labour unions have for pay inequality, exploring the role of this institutional actor seems an important endeavour in understanding how employees view inequality and as such their managers.

Again, investigating how labour unions enter the picture is best studied on the workplace level, where it is possible to observe in more detail in which ways unions are involved in pay matters and in the relationship between employees and managers. The nuances would be lost by aggregating the role of unions to the country level (OECD, 2019). Is it really, as has been repeatedly found on the macro level, that unions simply reduce pay inequality, or might their role be more complex by, for instance, also influencing the perception of inequality by establishing procedural fairness, the opportunity to engage with reference groups by increasing transparency and the interaction between employees and managers by offering a channel of communication, and thus trust?

5.1 The crux about social comparisons to judge perceptions of pay fairness

In the previous chapters it was assumed that social comparisons, which are used to determine the fairness of pay inequality, are always deliberate. However, to use the words of Corcoran et

al. (2011: 122), “not all social comparisons appear to be such a deliberate and strategic process. Quite the contrary, they are often conducted spontaneously and without intention”. Such spontaneous, unintentional comparisons can for instance arise when new information about oneself or others in the organisation emerge (Wood, 1996). There are organisation-specific formal procedures such as performance appraisals or organisations’ pay policies that intentionally initiate comparisons (Balkin and Montemayor, 2000). Through the deliberate choice of making some information available while being secretive about other, organisations’ management play a decisive role in the initiation and outcome of social comparisons.

Cohen-Carash and Mueller (2007) derived two general practical implications for employers and managers to deal with possible negative emotions from social comparisons. Either they adhere to distributive and procedural fairness rules, or they “adhere to the strategy of maintaining secrecy about reward allocation” (Cohen-Carash and Mueller, 2007: 678). It is this aspect of the role of information to judge fairness that will help to address the role of labour unions in the intra-workplace pay inequality – employee trust in manager relationship, and thus to establish answers for research question 3.

5.2 (Non-)Transparency of pay

Since the referent choice in pay comparisons depends on the information available to employees, this section aims to shed some light on how transparent pay is. I will elaborate on the different wage-setting institutions, pay transparency laws and social norms on pay transparency. Moving from the firm to the institutional level, I will show that there are significant differences on the country, sectoral and occupational level in respect to wage-bargaining and as a corollary pay transparency. This analysis highlights that labour unions through collective bargaining establish transparency of pay levels. Put differently, employees in workplaces which are covered by collective bargaining are more likely to have the necessary information about others’ pay to engage in pay comparisons.

5.2.1 Transparency laws

Despite individual regulations for the disclosure of executive compensation of publicly-traded companies in the US (U.S. Security and Exchange Committee, 2014), Canada (Stikeman Elliott LLP, 2014), the UK (Baird and Stowasser, 2002), Germany (Handelsgesetzbuch § 285, 2018), Ireland and France (Ferrarini, 2008), in most countries executive pay, as almost all other forms of pay, is still a corporate secret. In a 2017 report for the EU Commission, Veldman (2017) found that whilst the majority of countries published ranked job titles and the corresponding

salary scales of the public sector, very few have taken measures to implement the Commission's recommendation to establish transparency on the average pay for categories of employees and positions in the private sector.

Germany's push for a draft law on the introduction of pay audits in companies with more than 500 employees was met with resistance by some conservative political parties, but particularly by some employers, who argued that next to the additional administrative burden, such a law would "provoke envy among employees when salaries are disclosed" (Veldman, 2017:35). This statement clearly indicates that employers are aware of the possible consequences of pay comparisons. More than that, their described fear indicates that intra-workplace pay differences in large German firms are likely to be unequal to a point where employees, especially those earning less, would perceive them as unfair. Exactly as Cohen-Carah and Mueller (2007) pointed out: "Keeping rewards secret prevents social comparison and, hence, reduces the possibility of perceived unfairness and envy" (p. 678). On the other hand, Norway and Sweden demonstrate that full transparency around pay is no utopian idea. In Norway, tax returns of every citizen have been published since 1863 (Collinson, 2016). These have been publicly available for anyone through an online government website (The Norwegian Tax Authority, 2018). Since 2013, though, citizens are being informed about the people who search for them (Doyle and Scrutton, 2014). Similar to Norway until 2013, in Sweden citizens can simply call the tax authority and demand information about other people's tax payments (ibid.).

Despite the limitation that Scandinavian transparency laws do not require companies to publish pay reports, it seems that the sheer possibility of available information has the intended effect. In a *Reuters* article, Stein Reegard, chief economist of the Norwegian Confederation of Trade Unions argued that "it is obvious that openness is significant. At least for a better-informed public debate about the different levels of wages in society, whether it's a question of leaders' wages or equal pay" (Doyle and Scrutton, 2014). It might come as no surprise that Scandinavian countries, with Norway and Sweden leading the way, have significantly lower income inequality levels (OECD, 2015) and higher levels of trust than for instance the UK or US (Ortiz-Ospina, 2016).

So how do employees evaluate fairness of pay when organisations are not obliged be transparent about employees' pay? In the absence of laws that force companies to make pay transparent, other labour market institutions come into play. It is here that we return to research

question 3, and the role of labour unions for the intra-workplace pay inequality – employee trust in managers relationship.

5.2.2 Wage-bargaining levels and institutions

In the absence of transparency laws, the availability of pay information depends on the way pay is initially negotiated. As such, the level of wage bargaining can arguably be viewed as an indicator of pay transparency. In their OECD (2019) report “Negotiating Our Way Up: Collective Bargaining in a Chaining World of Work”, the authors point to considerable heterogeneity of wage bargaining levels across countries. Despite these differences, the authors are able to identify three country clusters. The first group is characterised by a system that relies predominantly on wage bargaining on the national level, and to a lesser degree on more centralised forms. The second and largest group of countries relies mostly on sector-level wage-bargaining, while the third group, have a highly decentralised wage bargaining system almost exclusively on the company level.

Even within the same wage-bargaining level, there can be considerable differences in transparency depending on the institutions in place, e.g., are wages determined collectively or individually. In the UK for example, 54.8 per cent of all public employees were covered by collective bargaining agreements through labour unions, while only 13.9 per cent of employees in the private sector were union members (Department for Business Innovation & Skills, 2016). Taking together, only 25 per cent of workers in the UK are covered by collective bargaining agreements. Brown et al. (2001: 25) already concluded 20 years ago that “the reality for the vast majority of employees who work in the private sector in Britain is that management, not trade unions, now determine their pay”. In Germany on the other hand, 58 per cent of all employees (public and private sector) were covered by collective bargaining agreements in 2012 (Ellguth and Kohaut, 2013). While this is substantially more compared to the UK, it still leaves more than 40 per cent of workers whose wages are negotiated directly with management.

Notwithstanding the differences across countries, they all have one thing in common: a large share of workers has little knowledge about pay of other employees within the workplace as well as about employees in similar position in other workplaces. This implies that pay is transparent in workplaces covered by collective bargaining, and most likely be untransparent in workplaces without collective bargaining, unless the workplace has an internal pay transparency policy. Yet, even in workplaces with collective bargaining, not all employees are covered, and as a result not every employees’ pay is transparent. Not all occupations, for instance (senior) management positions, are covered, and pay scales are thus not fully

transparent. Some uncertainty about other employees' pay remains. It is this uncertainty about others' pay that necessitates employees to consider other form of fairness perceptions, next to equity in the distribution of pay.

5.3 The role of uncertainty and collective employee voice effect for perceived fairness and trust

Due to the general secrecy around others' pay, workers are often uncertain how to make distributive fairness judgments around pay in the workplace. In the presence of uncertainty about others' outcomes procedural fairness considerations take a more prominent role in workers' evaluation of outcomes (Skitka, 2002; Van Den Bos et al., 1997). This "fair process effect" (Folger et al., 1979) has first been found in experimental court settings (Folger et al., 1979; Thibaut and Walker, 1975) and was later repeatedly found in survey responses in organisational settings (Folger and Konovsky, 1989; Van Den Bos et al., 1997). The following sections first explain the fair process effect, establishing some conceptual clarity and explaining underlying theories for the effect, before linking labour unions and their use of collective bargaining to employee voice, perceptions of procedural fairness and ultimately trust.

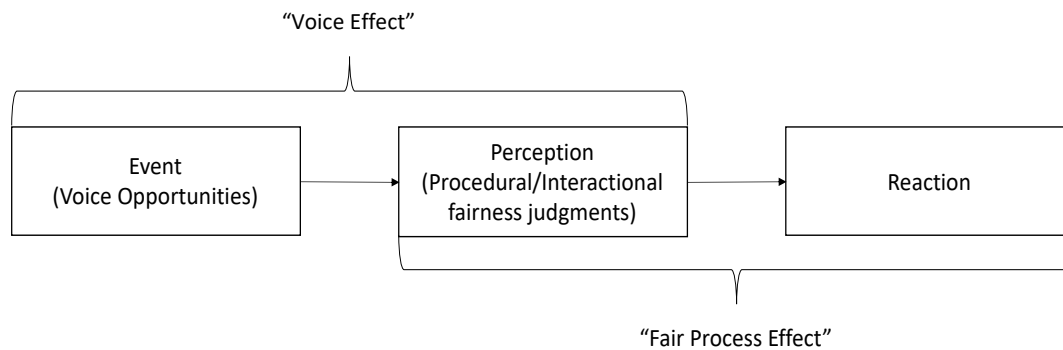
5.3.1 The "fair process effect"

In his review on the psychology of the fair process effect, Van den Bos (2005: 274) defines the fair process effect as "the positive effect that people's procedural fairness perceptions have on their subsequent reactions". Although the references are more than 15 years old, this effect is arguably the most robust finding in the field of organisational justice, organizational behaviour and management (Greenberg, 2003), with Van den Bos (2005) concluding that it is not about whether, in which settings or for which reaction the fair process effect can be found, but only about what mechanisms are responsible for it.

Before venturing into the underlying theories of the effect, it is crucial to establish some conceptual clarity. First, although it is labelled fair *process* effect and scholars consistently refer to procedural fairness, it refers to how the perception of being fairly *treated* affects reactions to among others, distributive outcome judgements (Van den Bos, 2005). One explanation for this rather confusing labelling goes back to the lack of differentiation between procedural and interactional justice when Folger et al. (1979) first came up with the term "fair process effect" (Bies, 2005). Since then, the term interactional fairness has been used to describe the perception of fair treatment related to social interactions, whilst procedural fairness relates to the fairness judgments of *formal* decision-making procedures only (Bies, 2005; Bies

and Shapiro, 1987). This implies that our interest lies in identifying what kind of factors influence the employee’s perception of being fairly treated when equity cannot be used as a rule to judge outcome fairness due to the lack in information about others’ outcomes and potentially also inputs. It is here where the second aspect of conceptual clarity takes over.

Figure 18: Disentangling the fair process effect



Source: Adapted from Van den Bos (2005: 278)

Early work on the fair process effect highlighted the role of voice and control. Allowing participants in an experimental court trial more voice and control resulted in higher acceptance of the verdict as opposed to those who received less control and voice (Folger et al., 1979; Thibaut and Walker, 1975). It is, however, not the voice that directly led to the more positive reaction to the outcome, but the perception of being treated fairly which is the outcome of having a voice. The experience of particular procedures that allow for employee voice is hence a precondition for the occurrence of the fair process effect. This is illustrated in figure 18 above.

Empirical studies on the interaction of procedural and distributive fairness suggest that as long as procedures are being perceived as fair, those involved in a social exchange might rate each other positively even if the outcome of the resource allocation is perceived as unfair (Bies, 2013; Brockner et al., 1994; Folger and Konovsky, 1989; Tyler and Lind, 1992). The interaction between procedural and distributive fairness is mainly rooted in two theories.

Self-interest theory (Thibaut and Walker, 1975) posits that as long as procedures are perceived as fair, people are less concerned about the short-term, in this case the current distribution of outcomes, because they believe that “they will receive their share of desired outcomes *over time*” (Brockner and Siegel, 1996: 392, italics in original). Contrary, if procedural fairness perceptions are low, they might not be willing to believe that they will

receive their fair share in the long-term and thus care more about the distribution of current outcomes.

In group value theory, Tyler and Lind (1992) argue that next to this process of self-interest, the individual is also entering a process of group dynamics based on social and psychological reasons. Being part of a group that signals procedural fairness increases the self-esteem of being a group member, signalling a positive future relationship. As a result, the member cares less about the current outcome distribution. Yet, if the member recognises that procedures are not what she considers fair, she might rethink the relationship with the group as a purely economic exchange, in which the current economic outcomes and thus current distributive fairness considerations are more important. Next to offering a clear link to the perception of the distribution of pay, procedural fairness has been directly linked to trust in management in that *“procedures that are structurally and interactionally fair will engender trust in the system and in the implementers of decisions, whereas a lack of structural and/or interactional fairness will elicit low levels of trust”* (Brockner and Siegel, 1996: 395; see also Ambrose and Schminke, 2003; Barling and Philipps, 1983; Brockner et al., 1997; Mayer and Davis, 1999; Stinglhamber et al., 2006). How to trade unions fit in this picture?

5.3.2 Employee voice and collective bargaining

Thibaut and Walker (1975) named process and decision control as two criteria for procedural justice. Whilst the former relates to people’s voice and input in overall processes and procedures, the latter relates to people’s actual influence in final decisions. Improving procedural fairness judgment by giving employees a say in processes before decisions are made can thus increase perceptions of procedural fairness (Bies and Shapiro, 1987), with Van den Bos (Van Den Bos et al., 1999: 560) calling voice *“the most generally accepted and best documented manipulation in procedural justice experiments“*. In line with the aforementioned notion of voice as process control, Wilkinson et al. (2014: 5), define employee voice as *“the ways and means through which employees attempt to have a say and potentially influence organisational affairs about issues that affect their work and the interests of managers and owners”*. One channel that gives employees a voice in procedures and processes in regard to pay are systems of representation (Bingham, 2016; Budd et al., 2010; Dundon et al., 2020).

Trade unions, despite their receding density and influence, are seen as one of the most important actors in the system of employee representation (Charlwood and Forth, 2009; Heery, 2011; OECD, 2019). The first recognition of unions as channel of employee voice can be

attributed to Freeman and Medoff's (1984) collective voice model. Rather than seeing trade unions as monopoly players that distort the efficiency of market wages, unions are characterised as improving the situation for employees, and if accepted and collaborated with, also for employers. Union collective voice provides employees with a direct communication channel to the management of their workplace to express discontent, which offers workers an alternative to quitting their job (Addison and Belfield, 2004). Whilst "nonunion workplaces can be quite oppressive when workers are exposed to unilateral, arbitrary, and unfair decisions of managers and supervisors" (Kaufman, 2005: 565), unions are able to reduce unfairness through formal dispute resolution procedures. The main tool to achieve this fairness restoration through formal procedures are collective bargaining agreements.

Traxler (1998) attributes collective bargaining three main functions. First, collective bargaining has a protective function in that it aims to establish fair and good working conditions. Second, it has, as described above, a voice function that allows workers to express their grievance and aspirations. And third, collective bargaining intends to allocate each worker a fair share of the economic progress, thereby fulfilling a distributive or inclusive function (see also Hayter et al., 2011). Relating to the power asymmetries between employers and the individual worker, particularly in regard to the setting of pay, Kaufman (2005) describes collective bargaining as "a form of countervailing power that balances the wage determination process ('levels the playing field')" (p. 560). One aspect of this countervailing power is to decrease asymmetries of information such as by making pay scales transparent (OECD, 2019). In sum, through collective bargaining trade unions have the ability to affect pay levels, pay systems, the distribution and range of pay as well as pay procedures (Heery, 2011).

Referring back to the issue of fairness in intra-workplace pay inequality, unions do not only help to reduce levels of pay inequality (Brown et al., 2003; Charlwood and Terry, 2007; Metcalf et al., 2001; Piketty, 2014), but they actively attempt to improve procedural fairness in pay through collective bargaining by formalising procedures, providing transparency of the pay process by monitoring, auditing and reviewing, as well as by supporting employee participation in pay determination and by establishing mechanisms to resolve disputes (Heery, 2000; Rosetti, 2019). These functions align well to Leventhal's (1980) six conditions for procedural fairness: consistency across time and person, suppression of biases, accuracy of information, correctability of decisions, representation in decision-making and maintenance of ethical and moral standards. Turnbull (2003) summarises the argument on the role of union collective voice for employee trust well when writing that:

“[when unions] ‘compel’ management to provide employees with information, consult them over business decisions, and provide opportunities for workers to participate in various activities that affect their working lives ... employees have a more favorable perception of the industrial relations ‘climate’ ... and trust can be developed between the parties” (p. 499-500)

The recognition of trade unions at the workplace and in particular the coverage of employees by collective bargaining agreements might therefore have two important functions for the effect of intra-workplace pay inequality on employee trust in managers. First, transparency of pay signals openness, honesty and even trust from the employer-side, all of which should raise the management's trustworthiness. Pay transparency also opens the door for employees to start comparing their wage with everyone else within the organisation to make a distributive fairness judgment. While this can but does not necessarily have to lead to wage harmonisation (Castilla, 2015; Mas, 2017; Ramachandran, 2012), it certainly gives room for discussions around wages (Estlund, 2012), something important for trust in managers as Mayer and Davis (1999) demonstrated in their quasi-field experiment. Second, collective bargaining can act as a mechanism for employee collective voice, which will affect the perception of being fairly and as corollary more likely to seeing pay differentials as positive, which will lead to more trust.

In light of this, one would expect the presence of collective bargaining to positively moderate the inequality-fairness-trust relationship. This generally chimes with Bryson's (2001) findings that employee trust in managers is higher in UK workplaces when “unions have sufficient power to make a positive contribution to the running of the workplace” (p. 91). Interestingly, Holland et al. (2012) only find a positive effect for direct voice arrangement and a negative effect of union voice arrangements for employee trust in management in Australian workplaces. However, as opposed to Bryson (2001), the authors (Holland et al., 2012) only measured union presence, and thus did not consider the positive effect of collective bargaining for perceptions of procedural fairness. Bryson's (2001) findings give room for another element that needs to be considered for understanding the effect of unions and collective bargaining agreements on the inequality-trust relationship: how much of that voice translates into actual positive or fair outcomes?

5.3.3 Voice opportunity and voice instrumentality: the limits of employee voice

Based on consistent findings for the positive effect of voice on fairness perception, Lind et al. (1990) went so far as to posit that “as long as there is an opportunity to express one's views

(voice) before a decision is made, procedural fairness is enhanced” (p. 952). However, it is unlikely that the positive effect of voice for perceptions of fairness, as outlined above, holds for indefinite levels of pay inequality. Avery and Quiñones’ (2002) work demonstrates the ambiguous role of employee voice for procedural fairness perceptions. In line with this “voice effect” element of the fair process effect, Avery and Quiñones (2002) find that fairness perceptions are the lowest for individuals with no voice opportunity. Yet, they also discovered that low levels of *perceived* voice opportunity, “measure of an individual’s perceptions of the amount of voice opportunity that has been provided” (p. 81), and high levels of non-instrumental voice behaviour, that is the actual expression of suggestions though without any influence on the outcomes of decisions, are associated with *low* levels of perceived fairness. It is this last aspect, the interaction of voice instrumentality and voice behaviour, that is of interest here.

As outlined above, trade unions’ involvement in pay matters and the exercise of collective employee voice through collective labour agreements is an example not only of voice opportunity – for instance through resolving disputes between employees and employers – but also of voice behaviour. By supporting employee participation in pay determination, formalising reward procedures, establishing due mechanisms to resolve possible disputes and providing transparency of the pay process through monitoring, audits and reviews, trade unions express their members’ opinion with the intent of improving fairness in pay matters. The aim of unions’ collective voice behaviour, and thus the instrumentality by which they are measured by their members, is to eliminate *unfair* pay inequality, both from a procedural and distributive perspective. However, to borrow the words of Avery and Quiñones (2002: 82), “the more voice behavior an individual exerts without influencing outcomes, the more likely he or she is to perceive the decision-making process to be unfair”. Or as Bingham (2016:19, italics added) puts it, voice is about “being heard *and* making a difference”.

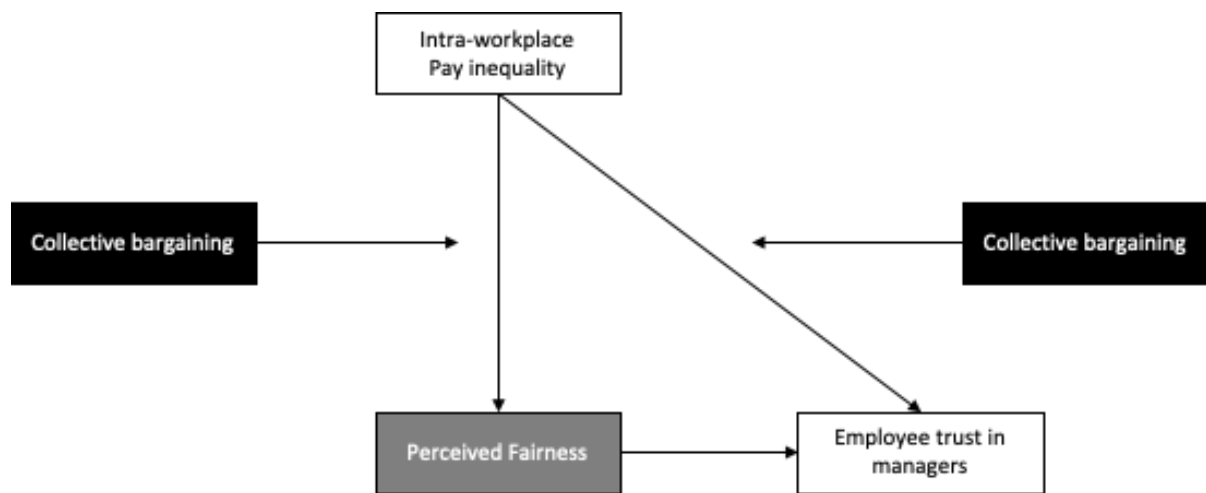
In the context of this research, this means that if employees realise that the level of pay inequality has passed a threshold that separates rational, fair levels of inequality from unfair levels of inequality *despite* the presence of collective bargaining systems which should prevent this from happening, the more likely employees are to perceive procedures and thus the social exchange with their managers to be unfair, resulting in lower levels of trust. This perspective aligns well with Bryson’s (2001) findings that “employees’ perceptions of union effectiveness are positively associated with higher trust in management” (p. 91), where effectiveness relates to, among others, a fairer work environment. I hence expect:

Hypothesis 3a: Collective bargaining moderates the relationship between pay inequality and trust in a curvilinear way.

Hypothesis 3b: Collective bargaining moderates the relationship between pay inequality and perceived managers fairness in a curvilinear way.

The proposed moderated mediation model is illustrated in figure 19 below.

Figure 19: Moderated mediation relationship



5.4 Methodology

5.4.1 Data sample

The same data samples as in chapter 4 were used.

5.4.2 Measurements

In addition to the same measures used in the previous chapter on the mediation analysis, proxies for the moderator collective bargaining were used.

Moderator: Collective bargaining

The main measure used was employee coverage by collective bargaining which captured the share of the workforce covered by collective bargaining agreements. The values of this measure range from 1 to 7, taking the value of 1 if no one in the workplace is covered by collective bargaining and 7 when all employees are covered.

In the sensitivity analysis, I looked at alternative measures, namely a dummy for occupational collective bargaining coverage, taking the value of 1 if the employee's occupational group is covered by collective agreements (0 otherwise). Lastly, to check for the robustness of the role of unions in this, I included a dummy variable for trade union presence at the workplace.

Table 22 below shows descriptive statistics for the newly added variables, whilst figure 20 shows frequency tables. The mean score for collective bargaining coverage is almost 4, which implies that the average employee is at a workplace where 40-59 per cent of employees are covered by collective bargaining. As can be seen in figure 20, the largest group of employees is in workplaces without any collective bargaining. Using unweighted data, around 32 per cent of employees are in workplaces where everyone is covered by collective bargaining. When using level-2 sampling weights, this share decreases to around 19 per cent.

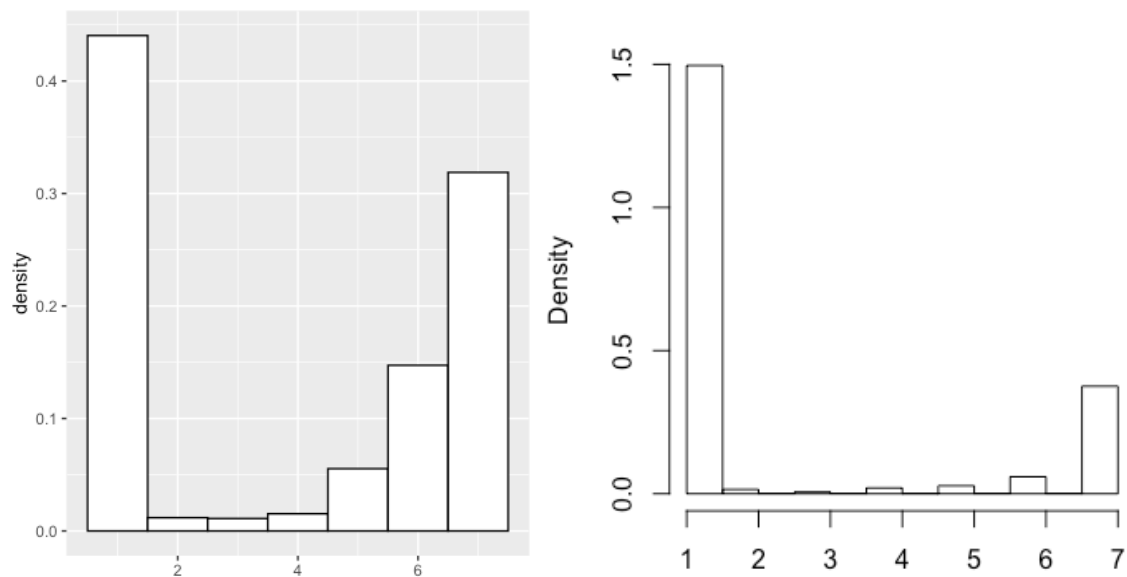
Whilst more than 40 per cent of employees are in workplaces where no worker is covered by collective bargaining, around 30 per cent are in workplace where everyone is covered. Moreover, 63 per cent of employees are in workplaces where a trade union is present, whilst 33 per cent are part of an occupational group that is covered by collective bargaining.

Table 22: Descriptive statistics including employee collective voice measures

	n	mean	sd	median	min	max	skew	kurtosis	se
Collective Bargaining Coverage	14900	3.96	2.75	5	1	7	-0.05	-1.88	0.02
Occupation covered by CB	10755	0.33	0.47	0	0	1	0.72	-1.49	0.00
Trade union at the workplace	11405	0.63	0.48	1	0	1	-0.53	-1.70	0.01

Note: unweighted sample

Figure 20: Histogram Collective Bargaining Coverage



Note: left figure based on unweighted data, right figure based on weighted data (level 2 weights)

5.4.3 Statistical approaches

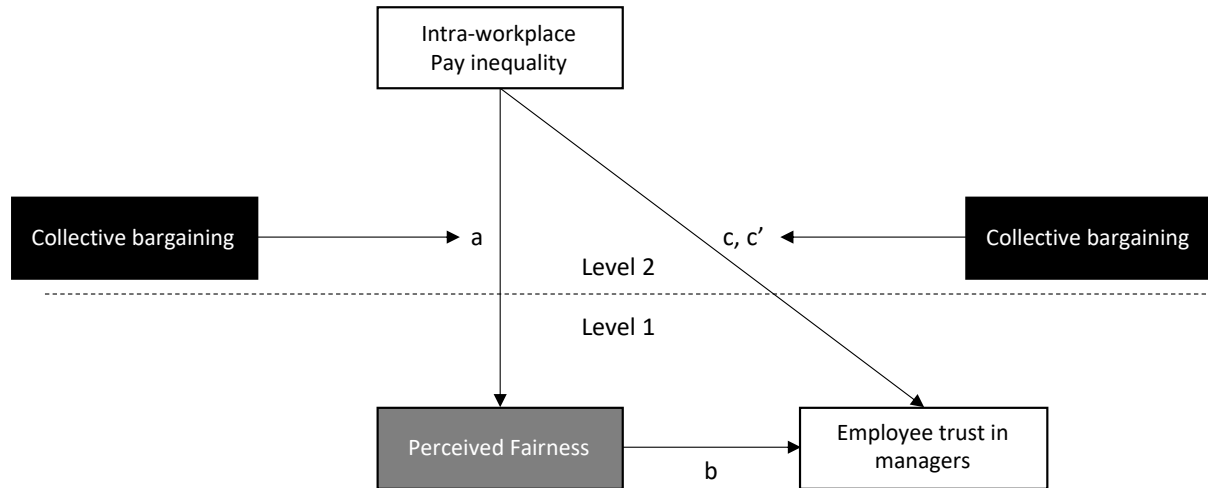
This chapter follows the same approach as the previous chapters. First, using linear multilevel models and thereafter random forest models to detect the moderating role of collective employee voice in the relationship between intra-workplace pay inequality and employee trust in managers as well as between intra-workplace pay inequality and the mediator perceived manager fairness.

5.4.3.1 Multilevel moderated mediation model

The multilevel mediation effects model of the previous chapter is kept for the single mediation through perceived manager fairness. It is complemented by the moderator collective bargaining, that is the interaction between intra-workplace pay inequality and collective

bargaining on trust and on the mediator perceived fairness. The model is depicted in figure 21 below. The model is in line with Baron and Kenny (1986).

Figure 21: Multilevel moderated mediation model



If at least one path of the mediation model is moderated, the whole affect is moderated:

$$c = ab + c'$$

The interaction effects were estimated using confidence bands in line with the equations below.

$$E[Trust_{ij}|(Pay\ Inequality_j, CollectiveBargaining_i)] = (\gamma_0 + vCollectiveBargaining_i) + (\gamma + \lambda CollectiveBargaining_i)Pay\ Inequality_j + u_{0j} + e_{ij} \dots Eq (11)$$

$$E[Fairness_{ij}|(Pay\ Inequality_j, CollectiveBargaining_i)] = (\gamma_0 + vCollectiveBargaining_i) + (\gamma + \lambda CollectiveBargaining_i)Pay\ Inequality_j + u_{0j} + e_{ij} \dots Eq (12)$$

Where,

E = expected values of trust and fairness given the interaction effect between pay inequality and collective bargaining

λ, v – regression coefficient for the effect of collective bargaining

$\gamma_0, \gamma, u_{0j}, e_{ij}$ = as per equations 1-3.

$\omega_0 = \gamma_0 + vCollectiveBargaining_i$ – simple intercept

$\omega_1 = \gamma + \lambda CollectiveBargaining_i$ – simple slope

5.4.3.2 Random Forest Model

To test for the moderating effect of collective bargaining, I divided the dataset into two groups: employees in workplaces with no collective labour agreements, and employees in workplaces with collective labour agreements. Contrary to the linear multilevel moderated mediation model, wherein collective labour agreements are measured using a 7-point scale, in the random forest model it is used as a dummy. This was done because it is not straightforward to include interaction terms in random forest models. For each group, I ran the same models as I did for the direct effect and for the mediation effect of perceived manager fairness. The results for both groups are then compared using Partial Dependence Plots (PDPs).

5.5 Results

First, the results for the multilevel moderated mediation analysis are presented. These are followed by those for the random forest models.

5.5.1 Multilevel moderated mediation model

As the results for the full unweighted sample in table 23 regression (1) and (3) below suggest, the association between pay inequality and trust in managers is positive and significant at a 0.1 percent level for collective bargaining coverage for both pay inequality measures. Hypothesis 3a was thus partly supported: employee collective voice moderates the association between pay inequality and employee trust in managers in a positive way.

Table 23: Regression results for the moderating role of collective bargaining coverage (full sample without weights)

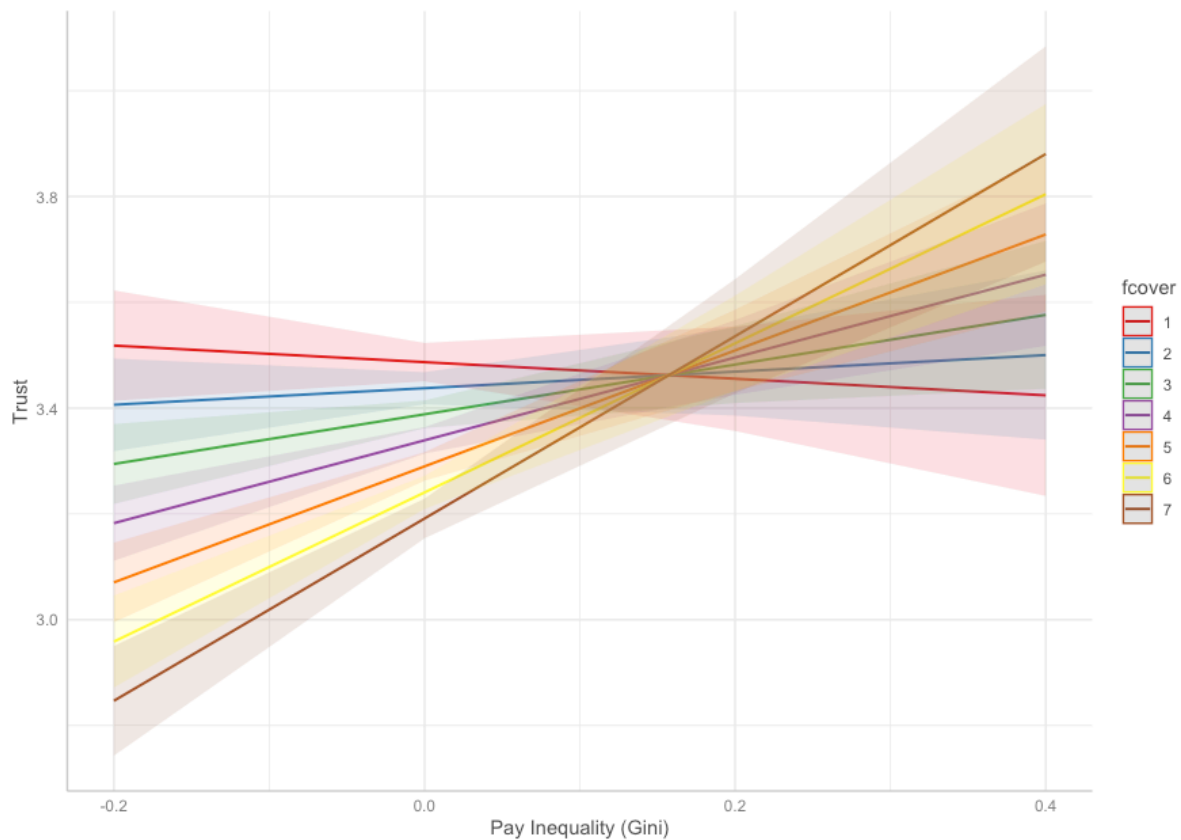
	Trust	Fairness	Trust	Fairness
	(1)	(2)	(3)	(4)
Gini coefficient	-0.390 (-0.283)	-0.533* (0.295)		
Coefficient of variance			-0.289* (0.148)	-0.373** (0.156)
Collective bargaining coverage	-0.022*** (0.006)	-0.013* (0.006)	-0.090*** (0.014)	-0.084*** (0.015)
Gini coefficient x Collective bargaining coverage	0.214*** (-0.060)	0.211*** (-0.063)		
Coefficient of variance x collective bargaining coverage			0.148*** (0.037)	0.150*** (0.035)
Constant	4.049*** (-0.072)	4.172*** (0.075)		
Observations (Employees)	11,925	12,592	11,898	12,159
Observations (Workplaces)	1,603	1,606	1,603	1,603
R-Squared (Level 1)	0.085	0.076	0.078	0.070
R-Squared (Level 2)	0.113	0.082	0.118	0.084

Note: control variables included * ** *** p<0.01

The marginal effects in figure 22 below illustrate the importance of collective employee voice for the relationship between pay inequality and trust. The red line with the label “1” refers to workplaces without any collective bargaining, whilst the brown line “7” represents workplaces where all employees are covered by collective bargaining. The figure suggests that

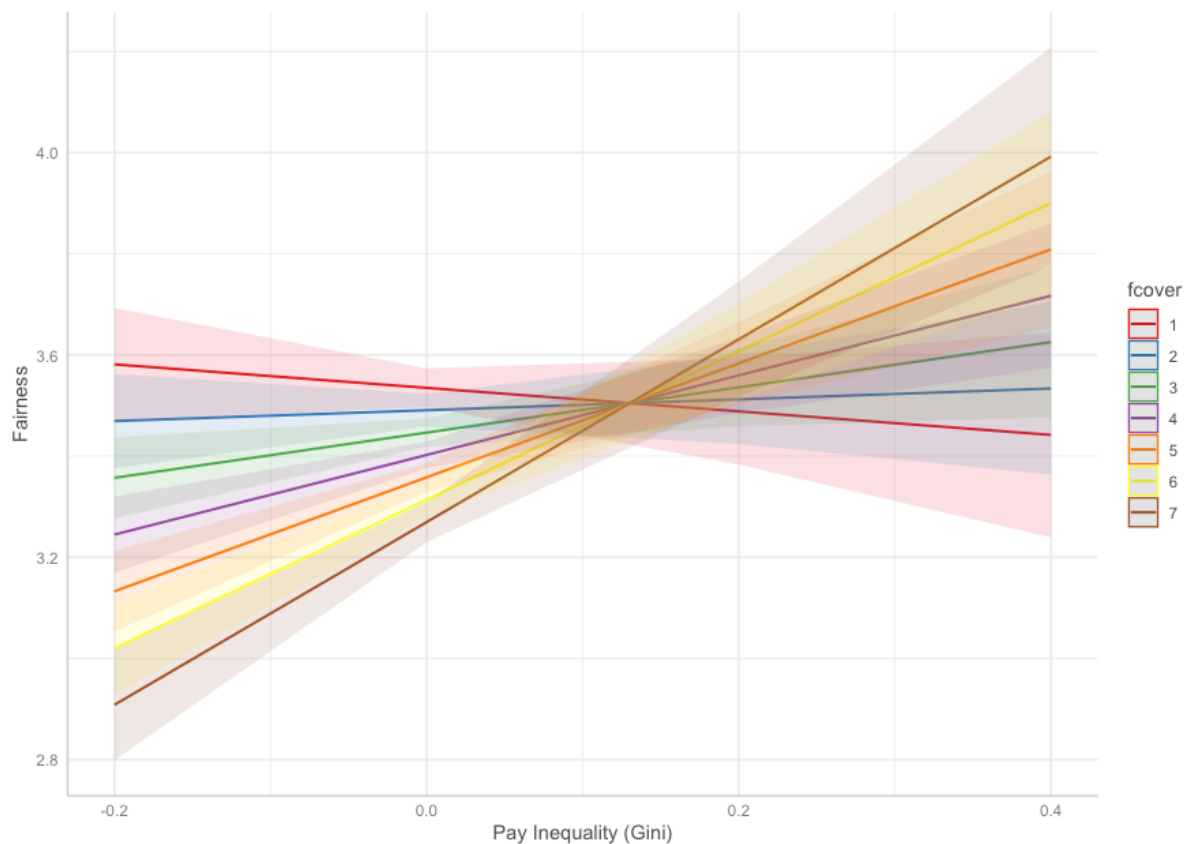
in workplaces where no employee is covered by collective bargaining agreements, trust falls slightly as pay inequality increases, while it increases in workplaces with a higher proportion of employees covered by collective bargaining. With each step-wise increase in collective bargaining coverage, the relationship between the Gini coefficient and trust turns more positive.

Figure 22: Marginal effect for the moderating effect of collective bargaining on the relationship between pay inequality and trust



Results for the moderating effect of collective bargaining in the relationship between pay inequality and fairness are displayed in table 16 regression (2) and (4). Almost identical to its relationship with trust in managers, collective bargaining positively moderates the relationship between pay inequality and perceived manager fairness. These findings also partly support Hypothesis 3b. The marginal effects are illustrated in figure 23 below. The figure suggests that with increasing levels of collective bargaining coverage, the relationship between the Gini coefficient and manager fairness turns more positive.

Figure 23: Marginal effect for the moderating effect of collective bargaining on the relationship between pay inequality and fairness perceptions



Results for the weighted regression models using the subsample of medium and large workplace are shown in tables 24 and 25. Using the scaled weights, method A and method B produce the same results, which support the findings from the full unweighted sample. In each case the interaction between the Gini coefficient and collective bargaining coverage and between the coefficient and collective bargaining coverage is suggested to have a positive effect on both employee trust in managers, and perceived manager fairness.

Results of the multilevel moderated mediation analysis suggest that employee collective voice proxied by collective bargaining coverage indeed positively moderates the relationship between intra-workplace pay inequality and both the outcome and mediator variable, using both the Gini coefficient and the coefficient of variance. As in the previous chapters, the results from the unweighted and weighted models suggest that this effect is predominantly found in medium and large workplaces.

Table 24: Regression results for the moderating role of collective bargaining coverage (sample of medium and large workplace with rescaled weights method A)

	Trust	Fairness	Trust	Fairness
	(1)	(2)	(3)	(4)
Gini	-0.397 (-0.595)	-0.204 (0.620)		
Coefficient of Variance			-0.376 (0.276)	-0.405 (0.314)
Collective Bargaining Coverage	-0.004 (0.010)	-0.002 (0.011)	-0.008 (0.010)	-0.003 (0.011)
Gini x Collective Bargaining Coverage	0.327** (0.118)	0.267** (0.121)		
Coef. Var. x Collective Bargaining Cov.			0.213*** (0.061)	0.194** (0.07)
Constant	4.001*** (0.137)	4.081*** (0.142)	4.022*** (0.138)	4.104*** (0.143)
Observations (Employees)	8,343	8,343	8,343	8,343
Observations (Workplaces)	938	938	938	938

Note: control variables included * p ** p *** p<0.01

Table 25: Regression results for the moderating role of collective bargaining coverage (sample of medium and large workplace with rescaled weights method B)

	Trust	Fairness	Trust	Fairness
	(1)	(2)	(3)	(4)
Gini	-0.397 (-0.595)	-0.204 (0.620)		
Coefficient of Variance			-0.376 (0.276)	-0.405 (0.314)
Collective Bargaining Coverage	-0.004 (0.010)	-0.002 (0.011)	-0.008 (0.010)	-0.003 (0.011)
Gini x Collective Bargaining Coverage	0.327** (0.118)	0.267** (0.121)		
Coef. Var. x Collective Bargaining Cov.			0.213*** (0.061)	0.194** (0.07)
Constant	4.001*** (0.137)	4.081*** (0.142)	4.022*** (0.138)	4.104*** (0.143)
Observations (Employees)	8,343	8,343	8,343	8,343
Observations (Workplaces)	938	938	938	938

Note: control variables included * p ** p *** p<0.01

However, the linear regression model interaction cannot tell us anything about the potential curvilinear effect of intra-workplace pay inequality for employee trust in managers. We thus turn to the results of the random forest model, where we split the dataset into two groups: employees in workplaces with collective bargaining coverage, and employee in workplace without collective bargaining coverage.

5.5.2 Random forest model

Variable importance scores (table 26) for the three measures of collective bargaining all suggest a significant role of the different types of collective bargaining for both employee trust in managers and perceived manager fairness. Our main moderator collective bargaining coverages is shown to have the highest variable importance score among the three variables.

Table 26: Variable importance scores moderated mediation analysis

	Employee trust in managers					Perception of fairness	
	Variable importance (permutation importance)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>Measurements of collective bargaining</i>							
Collective bargaining coverage	18.88	20.01	15.07	17.26	13.28	16.83	
Occupational coverage by collective bargaining	11.45	11.13	6.53	9.14	5.86	9.27	
Trade union presence	15.00	16.68	10.35	12.18	10.15	14.85	
Number of trees	500	500	500	500	500	500	500
Number of variables tried at each split	3	3	3	3	3	3	3
Mean-squared residuals	0.919	0.925	0.358	0.357	0.340	1.167	

Sample size: test data, N=2145 worker observations.

The results of the linear model suggested that the collective bargaining coverage has a positive effect on the association between intra-workplace pay inequality and employee trust in managers. Yet, is there a point after which the positive relationship breaks down, as hypothesised?

Figure 24: PDP (Gini coefficient – trust, by collective bargaining coverage)

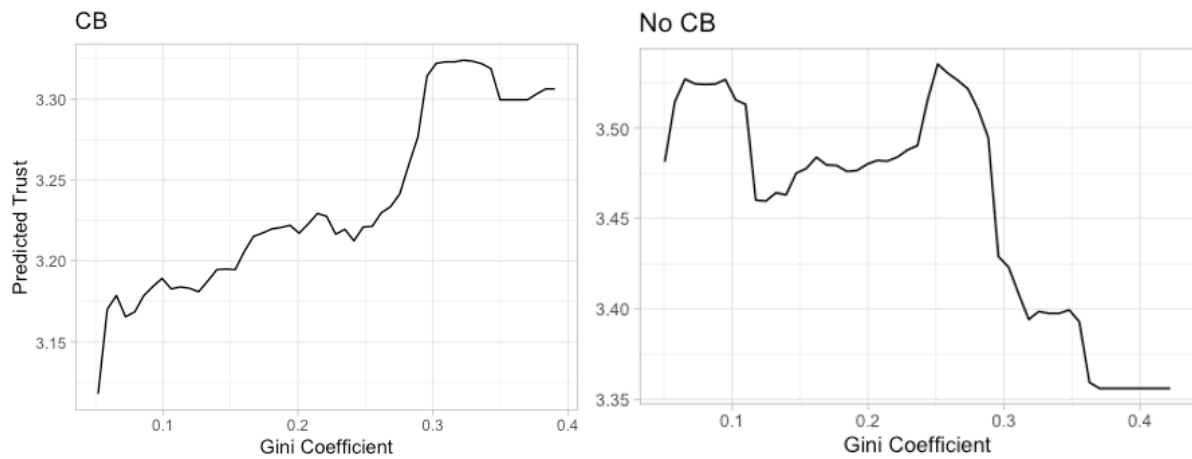
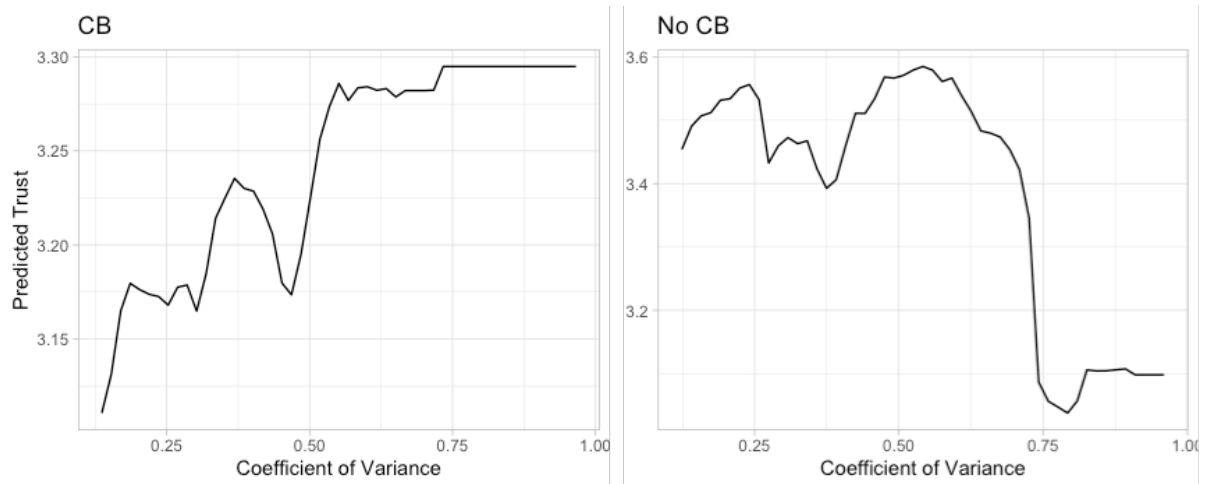


Figure 25: PDP (coefficient of variance – trust, by collective bargaining coverage)



At a first glance, predictions from the random forest model support the findings of the linear model: a positive relationship between intra-workplace pay inequality and trust for employees in workplaces with collective bargaining and a negative one for employees in workplaces without collective bargaining. However, at a closer look, there are some important non-linear aspects about the relationship that the PDPs are able to identify (see figures 24 and 25 above).

First, for employees in workplaces with collective bargaining agreements, pay inequality is only linked to higher levels of trust up to a Gini coefficient of around 0.3, after which the curve flattens and then turns negative. Second, for employees in workplaces without collective bargaining, there is a positive relationship between inequality and trust from a Gini coefficient of around 0.1 up until 0.25, after which the relationship plunges sharply. Similar results were found when using the coefficient of variance as an alternative inequality indicator. Hypothesis 3a

is hence only partly supported. There is a point after which increases in pay inequality are not associated with higher levels of trust, but it is not a clear inflection point.

Looking at figures 26 and 27, the results only partly support Hypothesis 3b. In line with the findings on the direct relationship, collective bargaining coverage influences the relationship between pay inequality and perceived fair treatment mostly positively.

Figure 26: PDP (Gini coefficient – fairness, by collective bargaining coverage)

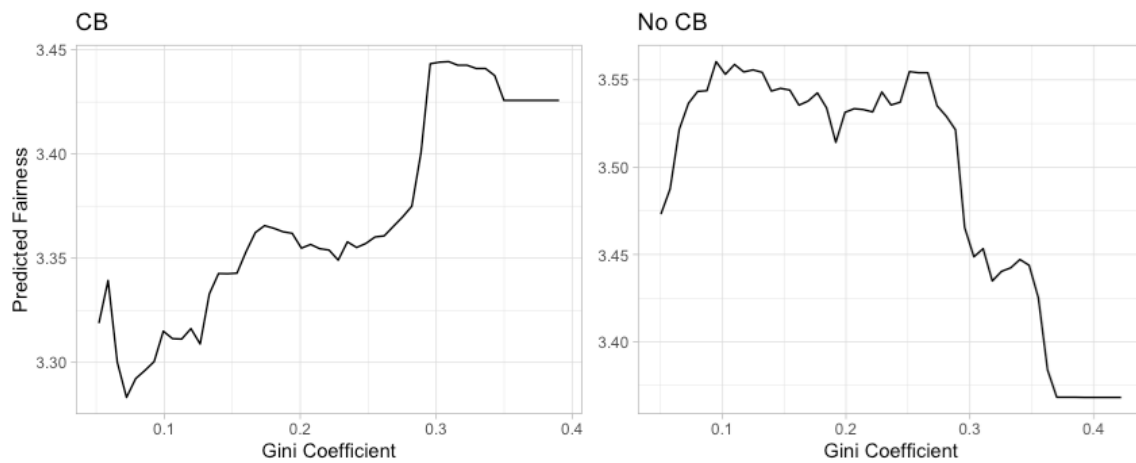
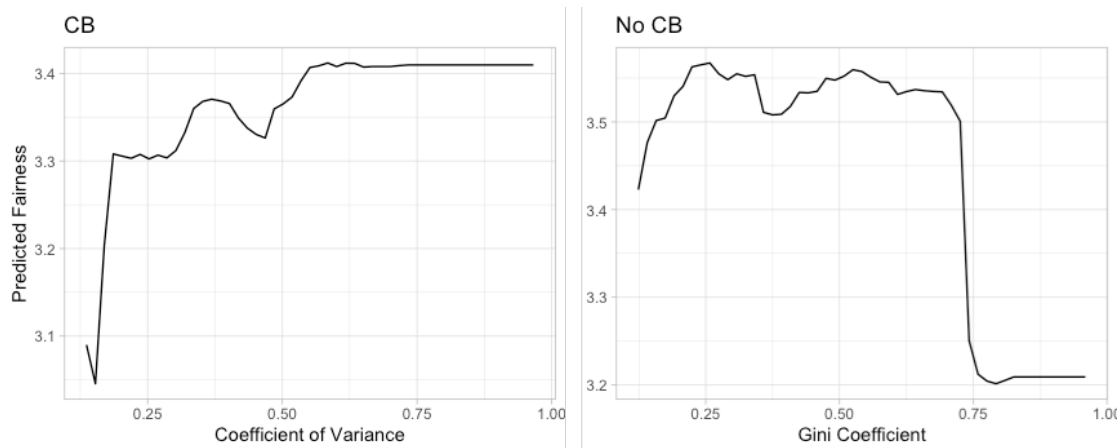


Figure 27: PDP (coefficient of variance – fairness, by collective bargaining coverage)



Though, at a Gini coefficient of around 0.3 the positive effect starts to decrease slightly (see figure 26) or remains completely flat in case of the coefficient of variance (see figure 27). For employees in workplaces without collective labour agreements, the relationship between pay inequality and perceived fairness is rather flat up until a Gini coefficient of around 0.26, after

which the effect turns strongly negative. This trend is mirrored when using the coefficient of variance.

In sum, collective bargaining coverage moderates the direct and mediation relationship mostly positively. Yet, this positive relationship plateaus or turns slightly negative after a Gini coefficient of around 0.3 for employees in workplaces with collective bargaining coverage.

5.6 Sensitivity Analysis

As collective bargaining coverage is only one possible proxy for union employee collective voice, I have included two additional measures to test the sensitivity of our results. The results for both alternative union voice measures, occupational group covered by collective bargaining agreements and the presence of a trade union at the workplace using linear multilevel regression models, are shown in table 27 below³. They suggest that both alternative employee collective voice measures are statistically significant and also positively moderate the relationship between intra-workplace pay inequality and both the outcome variable employee trust in managers and the mediator perceived manager fairness.

Table 27: Sensitivity analysis: alternative union voice measures

	Trust	Trust	Fairness	Fairness
	(1)	(2)	(3)	(4)
Gini coefficient	-0.264 (0.257)	0.389* (0.214)	-0.148 (0.278)	0.202 (0.225)
Trade Union Presence	-0.139*** (0.028)		-0.116*** (0.030)	
Occupational Group Covered		-0.086*** (-0.030)		-0.088*** (-0.032)
Gini x Trade Union Presence	1.431*** (0.330)		1.163*** (0.360)	
Gini x Occupational Group Covered		0.905** (0.385)		0.967** (-0.407)
Constant	3.995*** (0.080)	3.884*** (0.074)	4.000*** (0.088)	3.948*** (0.081)
Observations (Employees)	9,757	9,495	9,906	9,670
Observations (Workplaces)	1,562	1,514	1,562	1,516
R ² (Level 1)	0.079	0.074	0.074	0.072
R ² (Level 2)	0.114	0.115	0.088	0.080

Note: control variable included

* ** *** p < 0.01

³ For brevity, only results for the Gini coefficient are included in the sensitivity analysis.

Now turning to the sensitivity analysis of the random forest model. Results from the random forest analysis as presented in the PDPs below (see figure 28 and 29) suggest a similar picture to that for collective bargaining coverage. In the absence of trade unions at the workplace, the relationship between the Gini coefficient and employee trust in managers is negative. When a trade union is present, the effect the relationship between intra-workplace pay inequality and employee trust in managers is positive, plateauing after at Gini coefficient ~ 0.32 (see figure 28 below).

Figure 28: PDP (Gini coefficient – trust, by trade union presence)

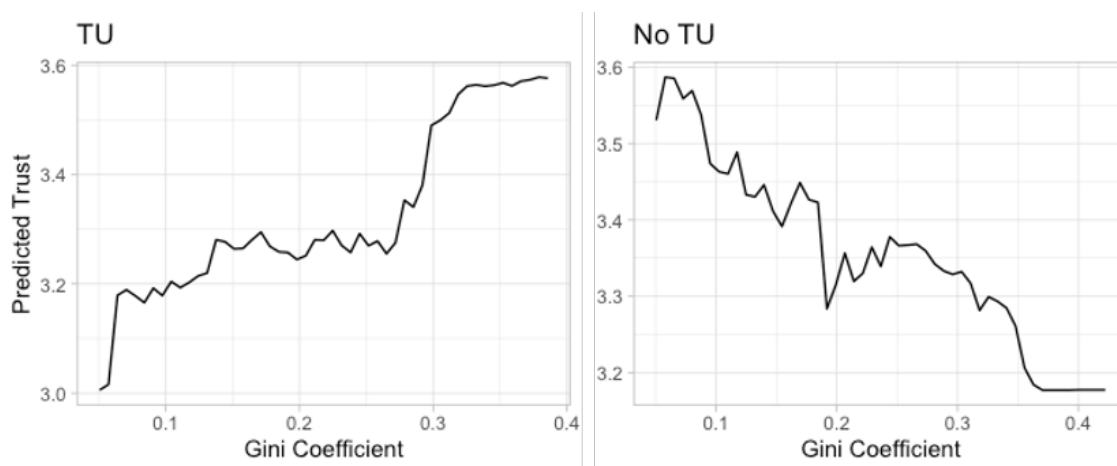
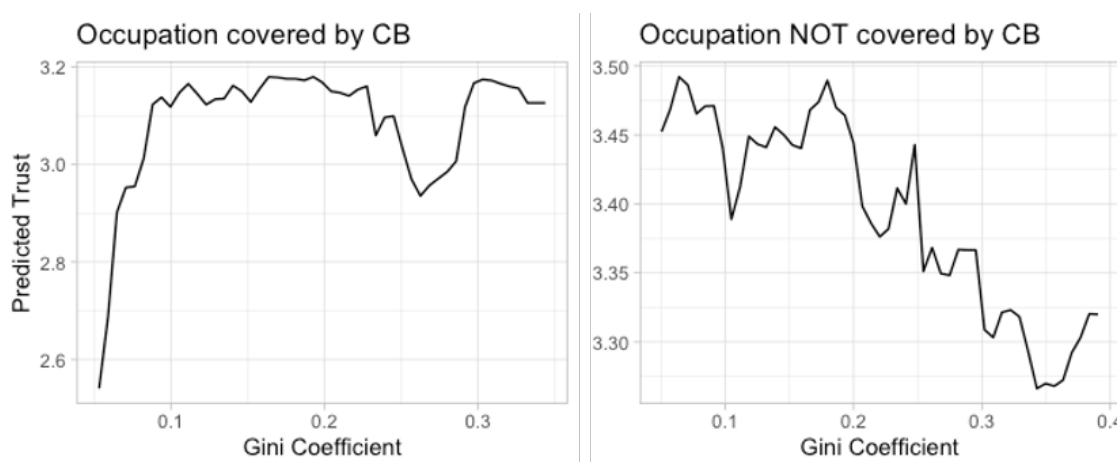


Figure 29: PDP (Gini coefficient – trust, by occupational group covered by collective bargaining)

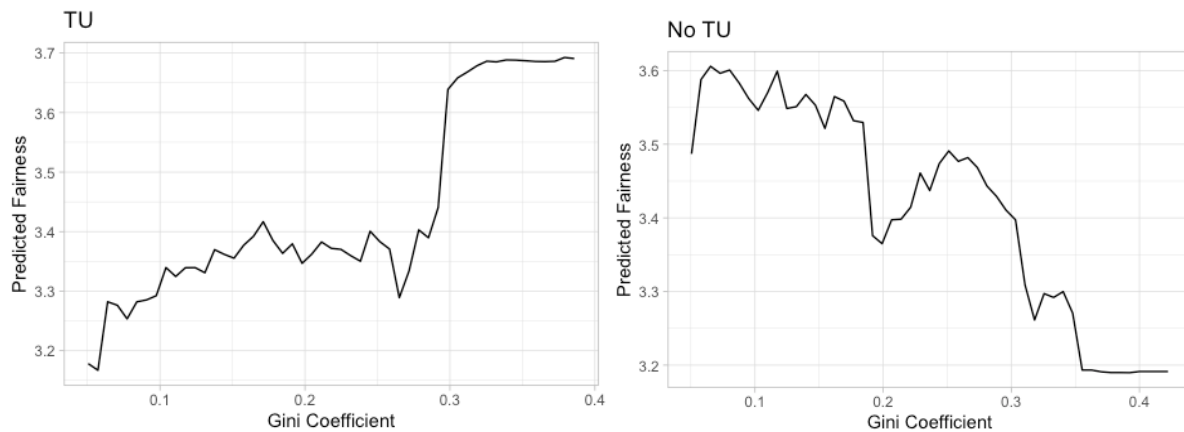


Similarly, looking at employees whose occupational group are covered by collective bargaining agreements, the relationship between pay inequality and trust is first taking the shape of an inverse U, where the inflection point after which the positive relationship turns

negative is at a Gini coefficient ~ 0.2 . However, after this dip, trust increases again before turning slightly negative at ~ 0.3 . For employees whose occupational group is not covered by collective bargaining agreements, the relationship between pay inequality and trust is suggested to be negative.

Turning to the role of the alternative employee voice measures for the relationship between intra-workplace pay inequality and perceived manager fairness, the results suggest a similar association, though with one important exception. First, for the moderator trade union presence (see figure 30), the PDPs mirror those for pay inequality and trust above. For employees in workplaces where a trade union is present the relationship between intra-workplace pay inequality and perceived manager fairness is positive with a sharp increase at a Gini coefficient around 0.26. After this sharp increase, the relationship plateaus at remains on the same level. On the other hand, for employees in workplaces without any trade union presence, the association between intra-workplace pay inequality and employee trust in managers is negative.

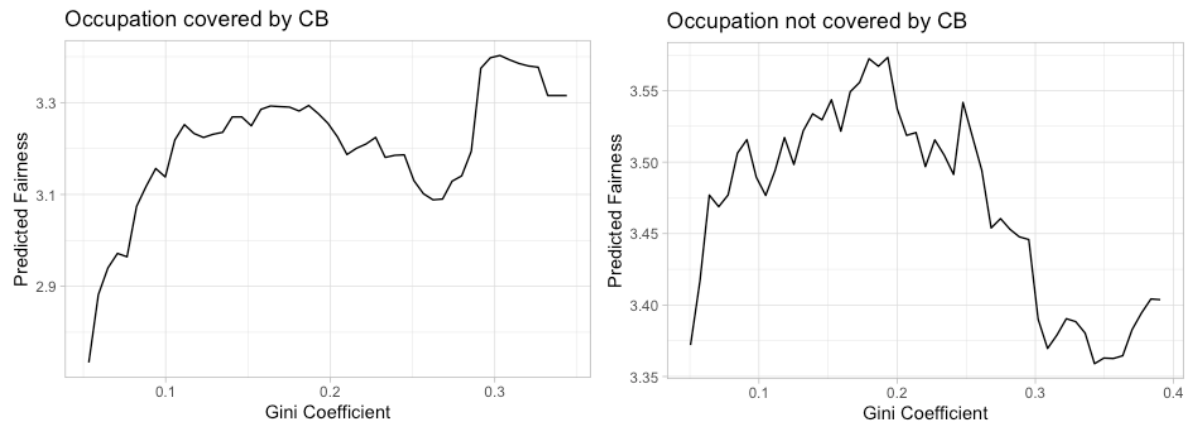
Figure 30: PDP (Gini coefficient – fairness, trade union presence)



For employees whose occupational group is covered by collective bargaining agreements (see figure 31), the relationship between intra-workplace pay inequality and perceived manager fairness mirrors that above for the relationship between pay inequality and employee trust in managers: first there is an inverse U-shape relationship, after which the association is positive again, before slightly decreasing after the Gini coefficient reaches 0.3. Lastly, contrary to the findings above, the relationship between the Gini coefficient and perceived manager fairness follows a clear inverse U-shape relationship for employees whose occupational group is not

covered by collective bargaining agreements, rather than being only negative. This last finding goes against hypothesis 3b.

Figure 31: PDP (Gini coefficient – fairness, occupational group covered by collective bargaining)



5.7 Discussion

This chapter was motivated to find out if the found direct and mediated results for the intra-workplace pay inequality – employee trust in manager relationship are universal or factor-contingent. Looking at the role of labour unions as institutional actor that has been able to reduce pay inequality, this chapter set out collective bargaining agreements as a tool that gives employees a voice in pay matters, establishes transparency of pay scales and improves procedural fairness. The main finding of this chapter is that employees in workplaces with higher shares of collective bargaining coverage perceive to be more fairly treated and perceive their managers to be more trustworthy when pay inequality is higher, whilst those in workplaces without collective bargaining are more likely to perceive managers as less fair and trust managers less when inequality is high. Yet once pay inequality passes a certain threshold, any increase in pay inequality does not lead to any further increase in fairness or trust but is likely to slightly decrease both phenomena. Using the unweighted full sample, and the subsample of medium and large workplaces with scaled sampling weights again suggests that the found effect applies predominantly to medium and large workplaces. Implications for theory, methodology, and practice are discussed below.

5.7.1 Theoretical implications

The positively moderating role of union voice offers further support for Freeman and Medoff's (1984) collective voice model. Next to improving the conditions and power of workers in the workplace through collective bargaining agreements, unions also benefit the management by establishing higher levels of perceived manager fairness and trustworthiness. The suggested findings hence offer empirical evidence for Turnbull's (2003) proposition that when unions are effective in giving employees a voice and establishing procedural fairness "employees have a more favorable perceptions of the industrial relations 'climate'... and trust can be developed between the parties" (p. 499-500). Although trust is initially lower in workplaces with collective bargaining, in workplaces with union presence and for employees whose occupational group is covered by collective bargaining, this might be more related to the working conditions that unions try to ameliorate by their presence rather than by unions wanting workers to have negative perceptions about their employers (Bessa et al., 2020).

Empirically, my results are in line with Bryson (2001), who finds that employees in workplaces with effective union presence have more trust than their counterparts in workplaces without effective trade unions. In addition to these findings, this research has used collective bargaining as a proxy for employee voice, thereby stressing *what* role labour unions play at the

workplace, rather than *that* they play a role. Holland et al. (2012) and Pyman et al. (2010), on the other hand, only find a positive effect for direct voice, not for the effect of union voice arrangements on employee trust in management, when studying Australian workplaces. The authors admit that their single item of union voice – labour union presence – falls short of capturing the strength and effectiveness of unions. Whilst these two scholarly works focused on the direct effect of union voice on trust, the suggested findings in this thesis stress the moderating effect unions have for the social exchange relationship between employees and managers.

The moderating role of voice for perceptions of fair treatment and as a result acceptance of unfavourable outcome decision is also in with empirical evidence in the social psychology literature (Folger et al., 1979; Mayer and Davis, 1999; Van den Bos et al., 1999). In their quasi-field experiment Mayer and David (1999) demonstrated that if employees are included in discussion in pay and promotion systems, they are more likely to view it positively and trust their managers more. Van den Bos et al. (1999) found that in situations where they have little information about others' pay, employees are more likely to accept unfavourable outcomes and feel fairly treated if they are given a voice in the decision process as opposed to those without a voice. This so-called “fair process effect” was also clearly identified in this research. Yet, whilst the aforementioned studies focused on direct voice, the findings of this PhD research emphasise the importance of collective union voice for the perception of fair treatment and as a result the trustworthiness of managers. Two partial findings about the moderating role of collective union voice still deserve further discussion.

First, the positive association between intra-workplace pay inequality and employee trust in managers flattens or even turns negative after a Gini coefficient ~ 0.3 . This signals that the positive effect of employee voice for fairness perception and trust might have its limits. These findings are in line with Avery and Quiñones' (2002) proposition and findings that not voice alone but the perceived instrumentality of voice is crucial for perceptions of fairness. If employees have a voice but this voice does not change anything in a positive way, it can actually decrease their perception of fairness. This highlights the importance of the type and dimension of voice for perceptions of fairness, something that seems to have received less attention in the social psychology literature. What Avery and Quiñones label “voice instrumentality” Bryson (2001) refers to as union effectiveness. It is not enough to have a trade union present but its members or the workers covered by collective bargaining agreements must also perceive the union to be doing their job right. This finding and conclusion is in

agreement with findings from a recent multilevel literature review on the effects of voice in organisations, wherein the authors highlight that it is an oversimplification to only attribute positive outcomes to employee voice (Bashshur and Oc, 2015; see also Morrison, 2011). Bashshur and Oc (2015) refer here to the potentially negative effect of voice on interpersonal relationships when the receiver feels attacked by the person or group's exercise of voice and potential negative effects on organisational performance. My findings rather point to the potential failure "to change an objectionable state of affairs or to improve the current functioning of the organization, group or individual" (Bashshur and Oc, 2015: 1531), and as such the effectiveness of voice.

Returning back to the definition of employee voice by Wilkinson et al. (2014), this implies that the positive effect of voice for employees depends on the success of the "attempt to have a say and potentially influence organisational affairs about issues that affect their work and the interests of managers and owners". In other words, the instrumentality of the concept of voice is the crucial factor, which supports Barry and Wilkinson's (2016) critique on the concept of voice in organisational behaviour (OB) research as pro-social, pro-management behaviour, specifically "as an expression of the desire and choice of individual workers to communicate information and ideas to management for the benefit of the organization" (p. 261). Voice is about more than communicating information or ideas. It is about having an impact on organisational affairs that affect employees. The interdisciplinary approach taken in this research, linking organizational justice literature of the "fair process effect" with industrial relations literature on union voice suggests that these two fields are thematically more closely aligned than employment relations and OB, in that both view perceptions of employees as distinct and as potentially misaligned from those of management. For both, voice is about a degree of control given to the employee from their management in order to, among others, improve the fairness of procedures in the workplace.

Second, findings from the random forest model for the moderating role of occupational group covered by collective bargaining for the pay inequality – perceived manager fairness relationship are different from the rest. For employees covered by collective bargaining, the relationship is first positive, then turning negative at a Gini coefficient ~ 0.19 and decreasing perceived manager fairness by 0.2 points before turning strongly positive at Gini ~ 0.25 and then turning negative again after Gini ~ 0.3 . For employees whose occupational group is not covered by collective bargaining the relationship between pay inequality and fairness follows an ideal inverse U-shaped pattern, with an inflection at Gini ~ 0.2 and both very low and very

high levels of pay inequality being perceived equally bad in terms of fairness. This is an interesting finding which this research is not able to theoretically explain and which future research should investigate.

5.7.2 Methodological Implications

The application of two different statistical methods highlighted the importance of applying more advanced techniques, particularly machine learning algorithms. Whilst the general tendencies of the moderating effect of collective bargaining was also shown to be rather positive, the random forest models suggest that the relationship is more complicated, depending on the measure used and the level of inequality present in workplaces. This should be a lesson for employment relations and HRM researchers to consider more advanced techniques. Failing to do so can lead to wrong implications drawn for theory and practice.

5.7.3 Practical implications

Considering the widespread decline of labour unions and of collective bargaining, this research has pointed to the positive effect of different union voice channels for the acceptance of pay inequality and employment relations, specifically the social exchange between employees and managers. The “substitutionist strategy” (Gall and McKay, 2001: 102) increasingly used by management to substitute established union voice, dispute resolution and so on with formalised and institutionalised “independent”, non-union forums, should hence be seen as problematic. Rather than substituting union voice in the form of collective bargaining with other workplace-managed forms of direct voice, new forms of direct voice should be seen and used as complementing union voice in areas where it falls short.

5.8 Concluding Remarks

Investigating the moderating role of collective bargaining, this chapter has provided empirical evidence that stresses this role of institutional factors for the fairness perceptions and for the effect of pay inequality on the employment relationship, proxied by employee trust in managers. Having empirically established a) a statistically significant relationship between intra-workplace pay inequality and employee trust in managers, b) the mediating role of fairness perceptions and shared values, and c) the moderating role of employee collective voice proxied by collective bargaining and union presence, the next chapter will focus on the wider implications of these findings for organisations’ performance.

Chapter 6: The intra-workplace pay inequality – workplace performance relationship

Intra-workplace pay inequality has an inversely U-shaped relationship with both perceived manager fairness and employee trust in managers. At low and moderated levels of pay inequality, further increases are suggested to increase both perceived manager fairness and employee trust in managers. Yet, once pay inequality passes a threshold at a Gini coefficient of approximately 0.25, further increases are suggested to decrease both fairness and trust. The findings have improved our understanding of when employees are likely to perceive intra-workplace pay inequality as positive and when as negative.

Previous theorising on this perception of pay inequality has predominantly focused on the effect intra-organisational pay inequality on organisational performance (Downes and Choi, 2014; Shaw 2014). Whilst fairness considerations were used as theoretical underpinning to argue for compressed pay dispersion in some studies (Martins, 2008; Pfeffer and Langton, 1993), others relied on the motivating effect on upward pay comparisons to argue in favour of higher levels of pay inequality (Lazear and Rosen, 1981; Lee et al., 2008). This chapter adds to the debate on the relationship between pay inequality and organisational performance in three ways. Next to a) advancing theory by including the role of employee trust in managers as theoretical mediator between intra-workplace pay inequality and workplace performance to argue in favour of a curvilinear relationship, and b) investigating the nonlinear relationship between intra-workplace pay inequality and workplace performance using the 2011 WERS as a representative sample of workplaces in Britain instead of workplace or industry level case studies, which are the predominant approach (Shaw, 2014), this chapter also c) sets out to compare the outcome of the results of intra-workplace pay inequality for two different types of workplace performance measures – perceptual and accounting-based.

6.1 Previous evidence

The overall empirical evidence for the relationship between pay inequality and firm or workplace performance is mixed. In line with the previous argument on the inequality-trust relationship, Shaw (2014: 535), in his review of the effects of pay dispersion, concludes that “the nature of the [inequality-performance] relationship (negative, positive, or nil) is difficult to predict in advance”. Shaw argued that the outcome of the relationship depends on, amongst others, the type of inequality, sample characteristics, control variables and whether the inequality stems from legitimate factors such individual incentives, seniority or tenure. Early

research on the relationship was divided in one camp of researchers advocating for the clear benefits of pay dispersion, whilst the other camp stressed the advantages of compressed pay distribution to increase performance.

Proponents of higher levels of pay inequality have predominantly relied on Lazear and Rosen's (1981) rank-order tournament theory as theoretical base. Framing a workplace's internal labour market as a constant competition for the next higher rank, the authors argue that the higher the additional award in the form of pay of the next higher rank, the more effort each competitor, i.e. employee, will exercise. In their article titled *Incentives, Productivity, and Labor Contracts*, Lazear and Moore (1984) further develop this argument, positing pay dispersion as an indicator for internal career and pay growth that will increase overall motivation and as a result labour productivity. In light of this focus on individual career and pay progression, it is not surprising that the underlying mechanism for their theoretical argument is workers' engagement in pay comparisons, in particular upward comparisons (Lazear and Rosen, 1981).

Beyond the focus on individual productivity levels, Rosen (1981) introduced the idea of economics of superstars, wherein he argued that the most talented managers will match with the largest firms. This idea was further developed into talent assignment theory (Gabaix and Landier, 2008; Terviö, 2008). The theory states that as larger firms are characterised by higher levels of pay inequality due to the increasing number of ranks between director level and bottom-level jobs, the most talented managers will be in more unequal firms. As a consequence of their managerial talent, these managers will be able to increase productivity and ultimately firm performance positively.

Whilst there is empirical evidence in favour of the positive inequality-performance relationship for the US (Lee et al., 2008), Denmark (Eriksson, 1999), Sweden (Heyman, 2005; Hibbs and Locking, 2000) and the UK (Mueller et al., 2017), there are both theoretical arguments and empirical evidence against such a straightforward positive relationship.

On the other side of the extreme, opponents of pay inequality rely on equity theory – though in this case the economic adaption by Akerlof and Yellen (1990) or Fehr and Schmidt (1999) – to argue that inequality is unfair resulting in dissatisfaction, shirking, unhealthy competition, and ultimately lower performance (Shaw, 2014). Early empirical studies such as that by Pfeffer and Langton (1993) on the effect of pay inequality among 17,000 individuals in more than 600 academic departments in the US, indeed found that greater wage dispersion was linked to lower

satisfaction and lower research productivity. Although the effect size decreased with wage level, tenure and salaries based on seniority or research output, it remained negative. More recent evidence for the US by Green and Zhou (2019) and Frederickson et al. (2010), for executive pay dispersion in the US by Ensley et al. (2007) and Faleye et al. (2010), and by Martins (2008) for more than 4000 Portuguese firms are generally supportive of the fair-wage hypothesis. Yet, as both Abeler et al. (2010) and Trevor et al. (2012) stress and as Akerlof and Yellen (1990) as well as Fehr and Schmidt (1999) write, inequality is not the same as equity. Arguing in favour of more equality might actually be perceived as unfair to some under the rules of equity as I have outlined in previous sub-chapters.

Based on the aforementioned argument that reactions to inequality depend on the locus of the inequality as internal or external, several authors find evidence for the moderating effect of the type pay system and ability to observe individual effort. In a month-long experiment in three different factories in India, Breza et al. (2018) find that whilst pay inequality increases absenteeism and decreases cooperation, the negative effect disappears “when workers can clearly observe productivity differences” (p. i). Kepes et al. (2009) use a sample of 326 small- and medium-sized long-haul trucking firms, as truckers are independent workers whose performance can be clearly observed, and test the moderating effect of performance-based pay versus politically based pay. In line with the argument on the locus of attribution, the researchers find that pay inequality has a positive association with performance – here measured in terms of time to fulfil the delivery and accident rate – when individual incentive pay is high, but a negative association when politically based pay is high. Their findings are generally in line with those of Shaw et al. (2002) who used the same database and a sample of 379 trucking companies and discovered that pay dispersion is less positive in interdependent settings. By concluding that “this [incentive] effect underscores the dangers of widely dispersed pay without normatively accepted reasons” (Shaw et al., 2002: 507), the authors give rise to the importance of procedural justice concerns of workers in the perception of pay inequality. Although the study by Breza et al. (2018), Shaw et al. (2002) and Kepes et al. (2009) are important in the sense that they were able to identify the moderating role of interdependent work settings and type of pay and of visible productivity differences, one needs to be cautious in generalising their findings. Next to studying small and medium firms, the authors investigated the hypothesised effects in one particular industry, where individual performance is relatively easy to observe, and used individual behavioural performance rather than overall workplace or firm performance measures.

Studying the four major sports leagues in the US – baseball, basketball, football and hockey – Frick et al. (2003) find that how pay inequality affects team performance varies among the different sports. The more interdependent players are in a team, the more important it is to “maintain harmony within the team by reducing wage disparities below the level required by productivity differences” (Frick et al., 2003: 481). The scholars state that their findings do not fully support nor reject tournament or equity, but that they rather stress the importance of context, motivation and fairness (Frick et al., 2003), highlighting the complexity of the pay inequality – performance relationship. Yet, their proposition that wage inequality must be lower than productivity differences in interdependent teams to maintain harmony is problematic because individual productivity is difficult to measure in such situations. Nevertheless, their findings generally chime with those of Shaw et al. (2002), stressing the role fairness concerns in the pay inequality – performance relationship.

In their study on NHL players, Trevor et al. (2012) are generally supportive of the aforementioned findings that as long as inequality reflects the differences in inputs, it will be team performance enhancing. Yet, crucially, when investigating non-linear effects through a polynomial term, the authors (Trevor et al., 2012) find a curvilinear relationship between the inequality that account for input differences and team performance. That is, once inequality becomes too high its effect on performance turns negative. This is an important finding that highlights that also in pay for performance systems, which are argued to establish procedural fairness, once levels of inequality reach a certain threshold the effect on performance turns negative. The theoretical implications of the aforementioned nonlinear findings by Trevor et al. (2012) notwithstanding, they are based on a very particular sample of the sports industry⁴.

Mahy et al. (2011) on the other hand use an employer-employee matched sample of firms that is representative of all firms in Belgium that employ at least 200 workers. Using a polynomial term, the authors find a clear inversely U-shaped relationship between intra-firm wage inequality and labour productivity significant at a 1-per cent level. Theoretically, the authors concluded that these results suggest that both tournament theory’s incentive effects and fairness and sabotage considerations are at play. Whilst up to a certain point incentive effects dominate, once a threshold is passed the negative effects of perceptions of unfairness, unhealthy competition and sabotage behaviour dominate.

⁴ For more work on pay inequality and team performance in the sports industry see for instance Berri and Jewell (2004) or Cyrenne (2017)

The empirical literature on the relationship between pay inequality and individual, team, workplace or firm performance suggests a non-uniform direction. Results vary depending on the country, industry, or type of inequality measure. At a closer inspection, though, in particular those studies that investigated moderating factors and those using non-linear models, stress the importance of fairness considerations in understanding when pay inequality might be positively perceived, resulting in superior performance, and when it might be perceived as negative, resulting in inferior employee effort and team, workplace or firm performance. One theory that does precisely look at this, and which I have already discussed in the previous chapters, is Adams' (1965) equity theory.

6.2 The role of fairness perceptions and trust for workplace performance

Adams (1965) argued that when employees are in a state of inequity, they will engage in behaviour that aims at decreasing the felt inequity. One way of doing this is to decrease their work effort proportionally to the felt inequity. If they feel that others receive higher outcomes for similar or lower inputs, the only power they have to resolve this inequity is by decreasing the only input they are able to influence instantaneously: their level of effort. In an environment where employees perceive their pay to be unfair compared to others, they will decrease their work effort, resulting in lower productivity and performance.

Several meta-analyses support Adams argument, finding fairness perceptions to be positively related to an employee's organisational commitment, organisational citizenship behaviour and overall job satisfaction levels (Cohen-Charash and Spector, 2001; Colquitt et al., 2001). These aspects in turn have been repeatedly linked to individual and organisational performance measures (Bryson et al., 2017; De Gieter and Hofmans, 2015; Kim and Brymer, 2011; McClean and Collins, 2011). Moreover, an employee's fairness perceptions have been directly linked to individual job performance (Collins et al., 2012; Sieweke et al., 2017). In line with the social exchange perspective taken in this research, Collins et al. (2012) argue that the positive relationship between organisational fairness perception and employee job performance are based on employees viewing "enhanced workplace contribution as fulfilling their reciprocal exchange obligations" (p.1009) and that perceptions of unfair treatment result in less performance efforts "because they [employees] suspect reciprocation will not occur" (p. 1009). In other words, if employees perceive the level of inequality to be fair, they are more likely to put in effort to balance the social exchange relationship with their managers/employers.

Yet, the study that most clearly points to our proposed non-linear relationship between pay inequality and performance, through fairness, is that by Chi et al. (2019). Based on a sample of 420 employees and 18 middle managers out of a total of 600 employees of a shipbuilding company in China, and longitudinal monthly pay and employee performance data between 2005 and 2012, the authors find a non-linear, inversely U-shaped relationship between intra-firm pay gaps of immediate upward comparison pay gaps and employee performance. Employee performance was rated by department managers on a scale from 1 to 4, thus subjectively. Chi et al. (2019) based their argument on Adams' (1965) equity theory and his use of social comparisons to determine equity. It would be interesting to see whether a) similar results can be found for the UK across a larger sample of workplaces, b) the curvilinear relationship is also found for overall intra-workplace pay inequality and workplace performance, and c) the results hold when using accounting-based performance measures.

Next to decreasing their own work efforts, Adams (1965) also argued that employees might sabotage the work of other employees in an effort to restore equity in this way. The focus of the unfairness thus shifts from the social exchange with the managers to the envy felt for the unjustly favoured worker. Indeed, several studies on employees' reactions to unfavourable comparisons showed that, if the outcome of the comparison is perceived as unfair, employees display hostile feelings and counterproductive work behaviour toward those they envy (Cohen-Carash and Mueller, 2007; Smith et al., 1994). Using a critical incident technique, Cohen-Carash and Mueller (2007) find that if envy of a colleague's better performance is accompanied by perceived unfairness about the performance difference, the employee feeling envy is more likely to engage in counterproductive work behaviour. This can imply directly interfering with the colleague's performance, sabotaging his or her reputation, withholding information, backstabbing, coalition building and so on. The above-mentioned Lazear (1989) himself admitted that high levels of pay inequality can lead to uncooperative work behaviour. He concluded that a degree of pay compression is necessary to improve cooperation "that is detrimental to the firm" (Lazear, 1989: 561).

Second, in line with fairness perceptions, trust has been directly and indirectly linked to performance. Looking at the indirect effect, trust affects performance in at least three ways. First, trust reduces the need for costly control and monitoring efforts (Ferrin et al., 2007), which in turn has been shown to increase employee effort (Dickenson and Villebval, 2004). Second, trust spurs innovation (Abrams et al., 2003; Clegg et al., 2002; Dovey, 2009; Nooteboom, 2013). Next to improving collective action, coordination and fostering a shared belief in the

organisation's mission (Dovey, 2009), trust overcomes the high degree of uncertainty in and improves the collaboration necessary for innovation processes (Nooteboom, 2013). Similarly, trust allows and facilitates the sharing of knowledge, crucial for idea generations and developments (Abrams et al., 2003). The importance of this indirect mechanism through which trust affects workplace performance – innovation – cannot be overstated. Next to being an important driver of labour productivity (Brown et al., 2001; Kurt and Kurt, 2015; Lucidi and Kleinknecht 2010), product innovation positively affects firm revenues (Hall, 2011; Oke et al., 2012; Thornhill, 2006) and is associated with higher stock market values (Blundell et al., 1999). Beyond innovation, trust in management and supervisors has been linked to higher levels of employee satisfaction (Ayree et al., 2002; Braun et al., 2013; Cho and Park, 2011a; Dirks and Ferrin, 2001, 2002; Gill, 2008; Matzler and Renzl, 2006; Thoms et al., 2002; Timming, 2012; Top et al., 2015), organisational commitment (Albrecht and Travaglione, 2003; Ayree et al., 2002; Coyle-Shapiro et al., 2002; Cullen et al., 2000; Innocenti et al., 2011; Timming, 2012; Top et al., 2015) and organisational citizenship behaviour (Colquitt et al., 2007; Dirks and Ferrin, 2002).

In light of these positive consequences of trust on employee level outcomes, scholars hypothesised and found a positive relationship between trust and individual level performance (Colquitt et al., 2007; Dirks and Ferrin, 2002; Sharkie, 2009). Sharkie (2009) discovered that by increasing extra role behaviour in employees, trust increased individual employee performance. As trust diminishes the need to control, whilst less control is simultaneously linked to more trust (Grund et al., 2009), it increases an employee's work efforts, decreases shirking (Dickinson and Villeval, 2004; Falk and Kosfeld, 2006) and the need to costly monitor, which leads to better employee and organisational performance. Two meta-analyses (Colquitt et al., 2007; Dirks and Ferrin, 2002) support the validity of Sharkie's (2009) results.

In line with these findings on the individual level, albeit to a lesser extent, a study on the NCCA basketball league in the USA found that teams with more trust in their leader outperformed those teams in the league with less trust (Dirks, 2000). Studying a wider sample of leading companies in the industrial, service and trade sectors in Israel, Tzafrir (2005) discovered that in workplaces with high levels trust, not only are HR managers more likely to provide training opportunities and are more attentive to internal promotion systems, but these workplaces are also characterised by better organisational performance. In a more recent study that looks at a representative sample of UK workplaces, Brown et al. (2015) found a positive relationship between aggregate levels of trust and workplace performance. It has to be pointed out, however, that the authors used a subjective measure of firm performance based on

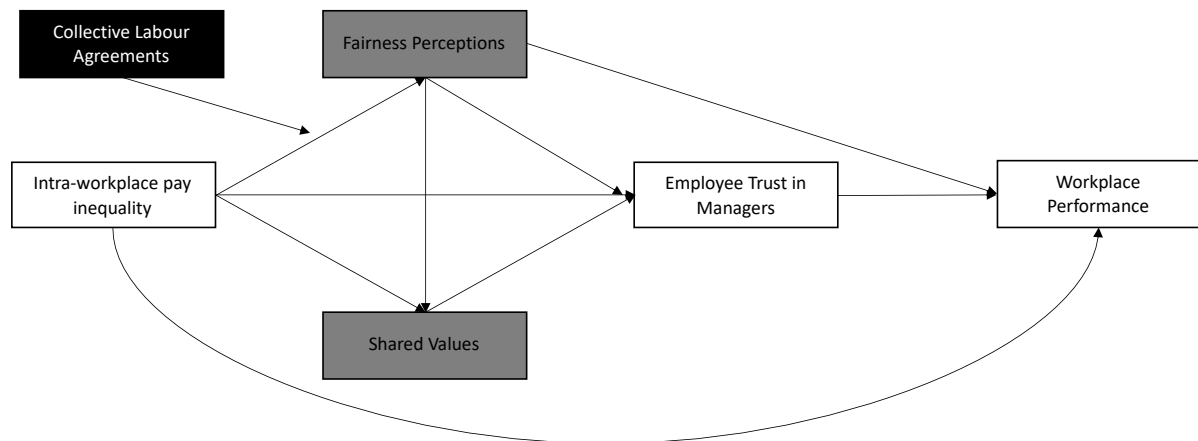
managers evaluation compared to competitors in the same industry, rather than accounting-based measures. Brandl (2021) using data from the European Company Survey found that strong mutual trust between employee representation and management is associated with higher firm profitability. Firm profitability here was a subjective measure which directly asked manager about the financial situation of the firm based on a 3-point Likert-type scale.

It can be concluded that both, employees' fairness perception and trust in their superiors, are important drivers of workplace performance. Having established a clear non-linear, inversely U-shaped relationship between intra-workplace pay inequality and employee trust in managers, and between intra-workplace pay inequality and employees perception of manager fairness, I will posit the following:

Hypothesis 4: The relationship between intra-workplace pay inequality and workplace performance is curvilinear.

Figure 32 below depicts the entire theoretical model.

Figure 32: Conceptual model of the inequality-trust-performance relationship



6.3 Methodology

6.3.1 Data sample

In addition to the MQ and SEQ, in this chapter I also included the Financial Performance Questionnaire (FPQ). The FPQ is a rather short questionnaire containing 10 items covering the basic financial details of a workplace. It was passed on to the same managers that filled out the MQ after their interview, with the instruction to fill it in themselves or to give it to someone who can and would provide the necessary information. The FPQ of the 2011 WERS did not include public sector workplaces. Compared to the MQ and SEQ, the FPQ had a rather low response rate of 28 per cent, amounting to 545 workplaces.

I only included observations based on workplace level financial performance data, thus excluding 130 observations, which were based on multi-workplace figures. I also excluded 16 observations with a turnover of less than GBP 1000, 9 observations with employment costs of less than GBP 1000, and 17 observations with costs for goods, materials and services of less than GBP 1000, because GBP 1000 is the lowest amount that needs to be entered. Furthermore, one workplace with employment costs of GBP 34 billion was excluded as this was detected as an outlier. Lastly, 4 workplaces with earnings before interest and taxes (EBIT) ratio above 0.9 were excluded because this is likely to be a measurement error. This resulted in a final sample of 161 workplaces. In the

In this empirical chapter, I worked with two different data samples. In data sample 1, I combined MQ items on workplace characteristics and pay inequality with the data from the FPQ. As this analysis is based on FPQ sample selection, which excluded public sectors workplaces and oversampled manufacturing, retail and business services workplaces, I included the FPQ sampling weights to restore representative of the results. Due to the limited data availability for the FPQ, data sample 2 only used the MQ, which included perceptual measures of workplace performance. This second data sample included 1810 workplaces and used the MQ sampling weights.

6.3.2 Measurements

Dependent variable: workplace performance

The literature on firm performance is full of different performance measures. In this research, I am interested in both financial and non-financial performance measures. Financial performance can be broadly divided into three categories: market-based, accounting-based and

perceptual (Dalton et al., 1998; Orlitzky et al., 2003). In the 2011 WERS, accounting-based and perceptual data are included; the former in the FPQ and the latter in the MQ.

Previous studies on workplaces performance using the 2011 WERS have mostly relied on the perceptual dimension of performance (see for instance Brown et al., 2009; Brown et al., 2015; Bryson et al., 2011; Bryson et al., 2017; Devaro, 2006; Jones et al., 2009; Wood et al., 2012; Wu et al., 2015), which was based on the following three-item question:

“Compared with other workplaces in the same industry how would you assess your workplace’s...”

- a) Financial performance
- b) Labour productivity
- c) Quality of service or product

Answers were provided on a five-point Likert-type scale ranging from “a lot better than the average” to “a lot below the average”. Due to unbalanced number of observations in each group (Bryson, 2013; Forth and McNabb, 2008), I created another dummy variable, which takes the value “1” if managers answered “a lot better than the average” and “above the average” and “0” otherwise. This is slightly different from Bryson’s (2013) approach, which only compared “a lot better than the average” to the rest, and from Jones et al.’s (2016) and Bryson et al.’s (2017) approach, which combines the lowest two groups into one, but otherwise keeps the ordinal structure.

Bryson (2013: 133) concludes that whilst “subjective measures of productivity dominate the British literature ... there is some debate about the properties of these data and their value in estimating influences on productivity compared with accounting-type data”. In line with his approach, here I also include accounting-based measures.

The FPQ includes data on turnover, value of assets, capital expenditure, employment costs, total purchase costs, and research and development. These data allow for the calculation of different accounting-based performance measures. In this empirical analysis, I included two of the most common and most widely used accounting-based performance measures (Orlitzky et al., 2003):

- a) Earnings before interest and taxes (EBIT). This measure captures the profit of an organisation before interest and taxes are deducted.
- b) EBIT ratio: EBIT / turnover. This measure captures the profitability as a percentage or share of total revenue/turnover.

Additionally, in line with Bryson (2013) and Jones et al., (2016) I calculated an accounting-based measure of labour productivity which is equal to log of the turnover value per employee. This allows a direct comparison between the subjective and accounting-based measure. This way of measuring productivity is in line with the ILO measure on labour productivity on the country level, which is computed by dividing GDP by the number of employed people (ILOSTAT, 2021).

I decided to use both dimensions of workplace performance measures because each measure comes with its advantages and disadvantages, especially in the case of the WERS. First, although the perceptual performance measures of the WERS have been shown to overestimate workplaces actual performance (Bryson et al., 2017; Forth and McNabb, 2008), and are only weakly related to objective-based measures (Forth and McNabb, 2008), the considerably larger sample size when using MQ and SEQ allows for the use of a representative sample of UK workplaces. Second, whilst FPQ should be more accurate as it is not based on the perception of an HR manager, but on actual numbers, FPQ data can be misleading as manager do not always have financial data on workplace performance but only on firm performance. Therefore, I only included FPQ data that relates to a single workplace (which further reduced the sample size). On the other hand, the considerably smaller sample size, which in the research is around one tenth of the MQ sample used, can be seen as a major disadvantage. Considering the trade-offs of each type of performance measure, Forth and McNabb (2008: 104) conclude that “it would be prudent to give most weight to results supported by both types of measures”.

Table 28: Correlation matrix workplace performance indicators

	EBIT	EBIT Ratio	Labour Productivity	Financial Performance	Labour Productivity	Product Quality
EBIT	1.00					
EBIT ratio	0.21***	1.00				
Labour Productivity	0.23***	0.08	1.00			
Financial Performance	0.02	0.12*	0.04	1.00		
Labour Productivity	0.00	0.05	0.16**	0.46***	1.00	
Product Quality	-0.06	0.05	0.02	0.28***	0.38***	1.00

Note: * p < 0.05, ** p < 0.01, *** p < 0.001

Table 28 above displays pairwise correlations between the different workplace performance measures. Variables within each type of performance measure – accounting-based and perceptual – are significantly and positively correlated. The correlations are small among the accounting-based measures, ranging from 0.21 to 0.23, and moderate among the subjective measures, ranging from 0.28 to 0.46. Across the two types of measures, there are only two out of nine possible significant correlations. There is a small positive (0.12) correlation between the EBIT-ratio and the subjective financial performance measure significant at a 10-per cent level, and a small positive (0.16) correlation between the accounting-based and the subjective measure of labour productivity, significant at a 5-per cent level. The fact that there is a small, albeit significant correlation between those measures that can be seen as counterparts, suggests that both measures bear a certain degree of similarity in measuring this dimension of performance.

Independent Variable: Intra-workplace pay inequality

As in the previous chapters, I used both the Gini coefficient and the coefficient of variance.

Control variables

In line with previous research studying workplace/organisational performance (see Brown et al., 2015; Bryson et al., 2017; Mueller et al., 2017), I included workplace size (total employees), workplace age, ownership type, share of workers below 21 and above 50 years, share of fixed-term worker, share of agency workers, share of union members, workplace legal status (for-profit vs. non-profit), and sector dummies.

Table 29 and 30 below show descriptive statistics for both data samples. Comparing the two tables, the mean and median values for both the Gini and coefficient of variance are almost identical, although the larger samples based on the MQ has higher maximum values. For the ordinal subjective performance measures mean values for financial performance and labour productivity are almost identical (all around 3.60), whilst the mean value for product and service quality is 0.18 points higher in the MQ sample compared to the FPQ sample. For the binary subjective performance measures, the mean values are between 0.02 and 0.07 points lower in the larger MQ samples compared to the smaller FPQ sample. In the MQ sample workplaces are on average longer in business and have more employees, have a slightly higher share of fixed-term and agency workers and more than twice as many union workers. The latter observation is likely to stem from the fact, that the FPQ sample excludes public workplaces.

Table 29: Descriptive statistics for performance model variables: weighted FPQ data sample

	N	Mean	Median	Min	Max
Gini coefficient	161	0.17	0.19	0.05	0.42
Coefficient of Variance	161	0.39	0.42	0.13	0.83
EBIT	161	1045065	30727505	-32351000	275676000
EBIT ratio	161	0.16	0.13	-0.82	0.88
Labour productivity (acc.)	161	154058	67548	27.19	2585714
Financial performance	161	3.60	4.00	1.00	5.00
Labour productivity (sub.)	161	3.75	4.00	1.00	5.00
Product/Service quality	161	4.25	4.00	1.00	5.00
Financial performance	161	0.57	1.00	0.00	1.00
Labour productivity (sub.)	161	0.56	1.00	0.00	1.00
Product/Service quality	161	0.86	1.00	0.00	1.00
Workplace size	161	290.11	45	5.00	5239.00
Workplace age	161	22.47	21	0.00	140.00
Ownership	161	0.89	1.00	0.00	1.00
Legal status (for profit)	161	0.95	1.00	0.00	1.00
Share of fixed-term workers	161	0.04	0.00	0.00	1.00
Share of agency workers	161	0.03	0.00	0.00	1.00
Share of worker U21/A50	161	0.38	0.33	0.00	1.00
Share of union workers	161	0.03	0.00	0.00	1.00
Manufacturing	161	0.22	0.00	0.00	1.00
Utilities	161	0.01	0.00	0.00	1.00
Construction	161	0.07	0.00	0.00	1.00
Retail	161	0.24	0.00	0.00	1.00
Gastronomy	161	0.14	0.00	0.00	1.00
Transport and Communication	161	0.02	0.00	0.00	1.00
Financial Services	161	0.01	0.00	0.00	1.00
Business Services	161	0.17	0.00	0.00	1.00
Public Administration	161	0.00	0.00	0.00	0.00
Education	161	0.003	0.00	0.00	1.00
Healthcare	161	0.09	0.00	0.00	1.00
Other Industries	161	0.04	0.00	0.00	1.00

Table 30: Descriptive statistics for performance model variables: weighted MQ data sample

	N	Mean	Median	Min	Max
Gini coefficient	1810	0.18	0.19	0.05	0.45
Coefficient of Variance	1810	0.40	0.41	0.12	1.17
Financial performance	1669	3.55	4.00	1.00	5.00
Labour productivity (sub.)	1643	3.67	4.00	1.00	5.00
Product/Service quality	1726	4.10	4.00	1.00	5.00
Financial performance	1669	0.54	1.00	0.00	1.00
Labour productivity (sub.)	1643	0.54	1.00	0.00	1.00
Product/Service quality	1726	0.79	1.00	0.00	1.00
Workplace size	1810	481.15	114.00	5.00	20746.00
Workplace age	1810	25.12	25	0.00	200.00
Ownership	1310	0.89	1.00	0.00	1.00
Legal status (for profit)	1810	0.82	1.00	0.00	1.00
Share of fixed-term workers	1803	0.06	0.00	0.00	1.00
Share of agency workers	1755	0.02	0.00	0.00	1.00
Share of worker U21/A50	1767	0.32	0.32	0.00	1.00
Share of union workers	1484	0.08	0.00	0.00	1.00
Manufacturing	1807	0.11	0.00	0.00	1.00
Utilities	1807	0.00	0.00	0.00	1.00
Construction	1807	0.05	0.00	0.00	1.00
Retail	1807	0.25	0.00	0.00	1.00
Gastronomy	1807	0.09	0.00	0.00	1.00
Transport and Communication	1807	0.04	0.00	0.00	1.00
Financial Services	1807	0.01	0.00	0.00	1.00
Business Services	1807	0.19	0.00	0.00	1.00
Public Administration	1807	0.03	0.00	0.00	0.00
Education	1807	0.06	0.00	0.00	1.00
Healthcare	1807	0.11	0.00	0.00	1.00
Other Industries	1807	0.07	0.00	0.00	1.00

6.3.3 Statistical Approaches

In this chapter I employed two different statistical methods. First, I used different weighted linear regression model, and second, I used random forest analysis.

6.3.3.1 Linear regression models: weighted least squared and (ordered) logit

In line with previous research that used both subjective and accounting-based measures of workplace performance (Bryson, 2013; Jones et al., 2016), I used two different statistical approaches. Due to the numerical nature of the accounting-based measures of pay inequality, I used weighted least squared regression models. Since the perceptual performance measures are binary and ordinal categorical, I use binomial and ordered logit models. To restore representativeness of the data, which was lost due to workplace sampling strategies, I include different workplace level sampling weights, one for the FPQ sample and one for the MQ sample. Both weights were provided in the WERS data set.

The mathematical quotation for this regression analysis is shown below.

$$\text{workplace performance}_i = \beta_0 + \beta_1 \text{pay inequality}_j + \beta_2 X_j + e_j \dots \text{(Eq 13)}$$

where

β_0 = intercept corresponding to workplace j

β_1 = regression coefficient for the effect of intra-workplace pay inequality

β_2 = regression coefficient for the effect of workplace-specific control variables X_j

e_j = error term

Due to the fact that the perceptual measures are derived from the MQ questionnaire, which has a substantially larger sample size, I also ran the perceptual measures on the FPQ sample to allow for comparison between the two types of performance measures.

6.3.3.2 Random forest analysis

As in the previous chapters, PDPs are used to illustrate the outcome of the random forest models and to compare the results to those from the traditional linear regression models.

6.4 Results

Results of the analysis will be presented in two parts. The first part shows the results for the analysis of the perceptual fairness measures, starting with the linear regression models followed by the random forest models. The second set of results is based on the analysis of the accounting-based performance measures from the FPQ. Again, first starting with the linear regression model and thereafter finishing with the random forest model.

6.4.1 Perceptual performance measures

First, results for the logistic regression models will be presented. These include output for the relationship between the two inequality measures and the binary performance variables for the MQ sample, the ordinal performance measures from the MQ sample, the binary performance measures from the FPQ sample and the ordinal performance measures from the FPQ sample. Second, these will be followed by and compared to results for the random forest analysis.

Linear logistic regression model

Table 31 and 32 display the results for the relationship between intra-workplace pay inequality and the three binary perceptual performance measures for the larger MQ sample. There is no significant relationship between either type of inequality measure and any of the three binary perceptual performance measures. The same is suggested for the pay inequality and the ordinal perceptual performance measures using the MQ sample (see table 33 and 34).

Table 31: Regression results for the relationship between the Gini coefficient and binary perceptual performance measures for MQ sample

	Financial Performance			Labour Productivity			Product Quality		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Gini	1.684 (1.212)	3.196 (5.278)	1.596 (3.353)	0.839 (1.187)	-3.981 (6.213)	0.411 (1.266)	-0.437 (1.500)	1.7406 (5.910)	-1.677 (1.750)
Gini-squared		-4.047 (13.831)			13.009 (16.956)			-5.789 (15.230)	
Controls	No	No	Yes	No	No	Yes	No	No	Yes
Observations	1,669	1,669	1,317	1,643	1,643	1,137	1,726	1,726	1,317
Pseudo R-squared	0.004	0.004	0.192	0.001	0.003	0.193	0.001	0.001	0.237

Note: * p < 0.1; ** p < 0.05; *** p < 0.01; MQ weights included

Table 32: Regression results for relationship between coefficient of variance and binary perceptual performance measures for MQ sample

	Financial Performance			Labour Productivity			Product Quality		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Coef.Var.	0.482 (0.586)	2.271 (2.172)	0.556 (0.621)	0.031 (0.572)	-0.528 (2.393)	-0.151 (0.612)	-0.240 (0.715)	0.613 (2.406)	-0.814 (0.832)
Coef.Var. ²		-2.043 (2.362)			0.640 (2.715)			-0.967 (2.635)	
Controls	No	No	Yes	No	No	Yes	No	No	Yes
Observations	1,669	1,669	1,317	1,643	1,643	1,137	1,726	1,726	1,317

Note: * p < 0.1; ** p < 0.05; *** p < 0.01; MQ weights included

Table 33: Regression results for the relationship between the Gini coefficient and ordinal perceptual performance measures for MQ sample

	Financial Performance			Labour Productivity			Product Quality		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Gini	1.573 (1.097)	-2.367 (5.778)	1.596 (1.127)	0.713 (1.093)	-5.667 (5.669)	0.026 (1.103)	0.681 (1.082)	2.153 (4.172)	0.386 (1.220)
Gini-squared		11.362 (15.698)			17.257 (15.536)			-3.780 (10.693)	
Controls	No	No	Yes	No	No	Yes	No	No	Yes
Observations	1,669	1,669	1,317	1,643	1,643	1,137	1,726	1,726	1,317
Pseudo R-squared	0.004	0.004	0.192	0.001	0.003	0.193	0.001	0.001	0.237

Note: * p < 0.1; ** p < 0.05; *** p < 0.01; MQ weights included

Table 34: Regression results for relationship between coefficient of variance and ordinal perceptual performance measures for MQ sample

	Financial Performance			Labour Productivity			Product Quality		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Coef.Var.	0.493 (0.524)	1.788 (1.976)	0.514 (0.551)	0.002 (0.511)	-0.559 (2.145)	-0.356 (0.526)	0.334 (0.535)	1.143 (1.767)	0.108 (0.605)
Coef.Var. ²		-1.468 (2.094)			0.639 (2.240)			-1.272 (1.985)	
Controls	No	No	Yes	No	No	Yes	No	No	Yes
Observations	1,669	1,669	1,317	1,643	1,643	1,137	1,726	1,726	1,317

Note: * p < 0.1; ** p < 0.05; *** p < 0.01; MQ weights included

The same regressions were repeated but on the smaller sample of FPQ workplaces. For the binary perceptual performance measures, results in table 35 and 36 suggest an inversely U-shaped relationship between both the Gini coefficient and the coefficient of variance and product and service quality, both significant at a 1-per cent level.

Table 35: Regression results for the relationships between the Gini coefficient and binary perceptual performance measures for FPQ sample

	Financial Performance			Labour Productivity			Product Quality		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Gini	-2.655 (4.011)	0.099 (15.668)	-2.316 (4.720)	1.088 (3.882)	4.347 (14.660)	0.789 (4.494)	8.189 (5.714)	75.611*** (24.199)	20.605** (8.335)
Gini-squared		-8.367 (40.727)			-9.970 (38.462)			-151.665*** (52.245)	
Controls	No	No	Yes	No	No	Yes	No	Yes	Yes
Observations	161	161	161	161	161	161	161	161	161
Pseudo R-squared	0.008	0.009	0.218	0.001	0.002	0.202	0.045	0.511	0.511

Note: * p < 0.1; ** p < 0.05; *** p < 0.01; FPQ weights included

Table 36: Regression results for relationships between coefficient of variance and binary perceptual performance measures for FPQ sample

	Financial Performance			Labour Productivity			Product Quality		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Coef.Var.	-1.805 (1.949)	6.123 (8.428)	-1.083 (2.012)	1.609 (1.771)	-6.143 (8.816)	1.593 (1.824)	5.451* (3.186)	57.496*** (16.300)	11.433** (0.765)
Coef.Var. ²		-9.653 (9.634)			9.730 (10.179)			-55.224*** (16.355)	
Controls	No	No	Yes	No	No	Yes	No	Yes	Yes
Observations	161	161	161	161	161	161	161	161	161

Note: * p < 0.1; ** p < 0.05; *** p < 0.01; FPQ weights included

There is no significant association between pay inequality and any other binary perceptual performance measures using the FPQ sample. Looking at table 37, the regression results suggest curvilinear relationships between the Gini coefficient and each ordinal perceptual performance measure. Whilst the curvilinear relationship between the Gini coefficient and perceived product and service quality is only significant at a 10-per cent level for the ordinal measure as compared to a 1-per cent significance level for the binary measure, those for the other two perceptual measures are significant at a 5-per cent level. These results are not corroborated when using the coefficient of variance (see table 38). Results from table 38 suggest that when using the ordinal measures, there is no significant relationship between the coefficient of variance and the three perceptual performance measures using the FPQ sample.

Looking at the Pseudo R-squared, the models including control variables are able to explain 22 per cent, 20 per cent and 51 per cent, respectively, in the variation in the perceptual measures of financial performance, labour productivity and product quality.

Table 37: Regression results for the relationship between the Gini coefficient and ordinal perceptual performance measures for FPQ sample

	Financial Performance			Labour Productivity			Product Quality		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Gini	0.933 (3.351)	5.448** (2.585)	0.884 (3.637)	1.098 (3.179)	29.239** (13.919)	1.511 (3.383)	1.951 (3.956)	31.389* (17.063)	28.520* (16.902)
Gini-squared		-15.99** (7.253)			- 78.949** (36.790)			-85.038* (44.076)	-66.020 (42.830)
Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Observations	161	161	161	161	161	161	161	161	161
Pseudo R-squared	0.008	0.218	0.218	0.001	0.002	0.202	0.045	0.511	0.511

Note: * p < 0.05; ** p < 0.01; *** p < 0.001; FPQ weights included

Table 38: Regression results for relationship between coefficient of variance and ordinal perceptual performance measures for FPQ sample

	Financial Performance			Labour Productivity			Product Quality		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Coef.Var.	1.151 (1.784)	10.753 (7.695)	0.835 (1.894)	1.171 (1.387)	2.028 (5.844)	1.929 (1.556)	1.923 (1.934)	9.663 (10.940)	3.765 (2.442)
Coef.Var. ²		-11.617 (8.611)			-1.060 (6.848)			-9.511 (13.521)	
Controls	No	No	Yes	No	No	Yes	No	No	Yes
Observations	161	161	161	161	161	161	161	161	161

Note: * p < 0.05; ** p < 0.01; *** p < 0.001; FPQ weights included

Overall, the results for the relationship between intra-workplace pay inequality and workplace performance using perceptual performance measures using traditional regression approaches paint a mixed, inconclusive picture. Whilst the results do suggest curvilinear relationships between inequality measures and the three performance measures, the results are sensitive to the type of performance measure (binary vs. ordinal), the sample (MQ vs. FPQ) and the type of pay inequality measure (Gini vs. coefficient of variance). Statistically significant results were only found for the smaller FPQ sample. Here, the curvilinear relationship between pay inequality and perceived product and service quality was the most robust, found for both inequality measures and for both binary and ordinal measure, also in respect to the latter only for the Gini coefficient.

Random Forest

In line with the presentation of the results from the logistic regression models, with respect to those from the random forest models, I start with the PDPs for the MQ sample, which is then

followed by the results for the FPQ sample. To avoid losing the reader, I only included PDPs for the ordinal measures, as this would have otherwise resulted in 24 different PDPs.

Figure 33: PDP (Gini coefficient – financial performance) MQ

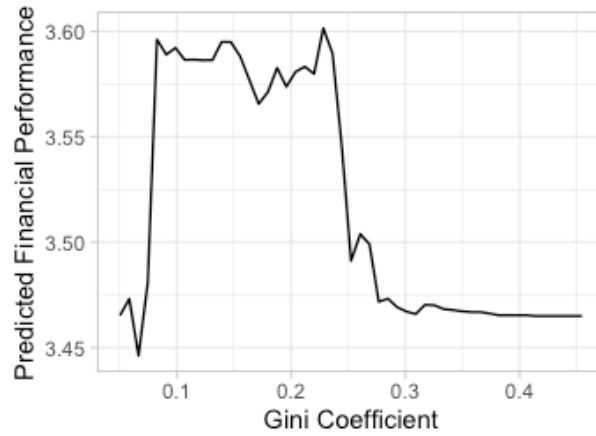


Figure 34: PDP (Gini coefficient – labour productivity) MQ

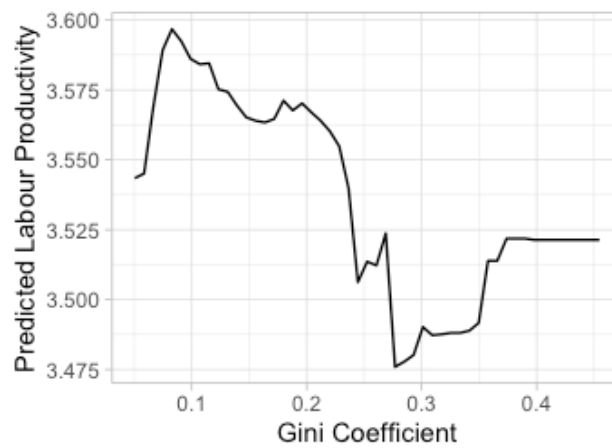


Figure 35: PDP (Gini coefficient – product and service quality) MQ

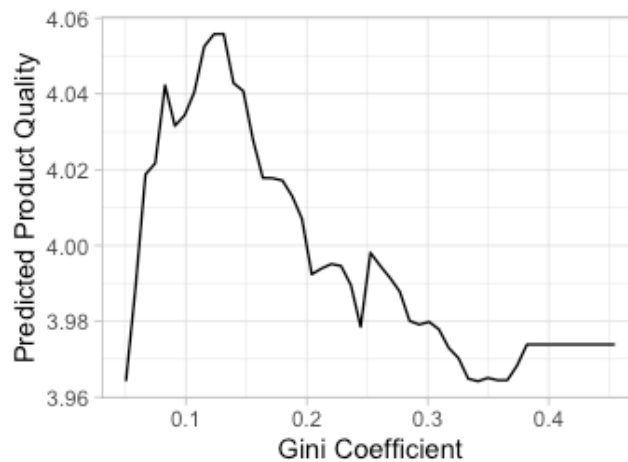


Figure 36: PDP (Coefficient of variance – financial performance) MQ

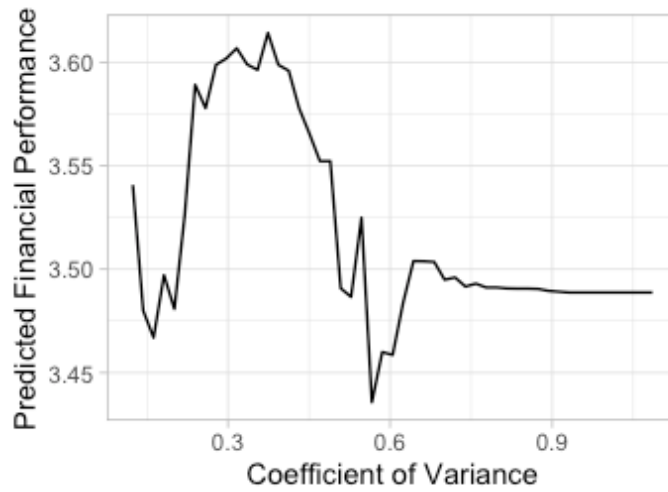


Figure 37: PDP (Coefficient of variance – labour productivity) MQ

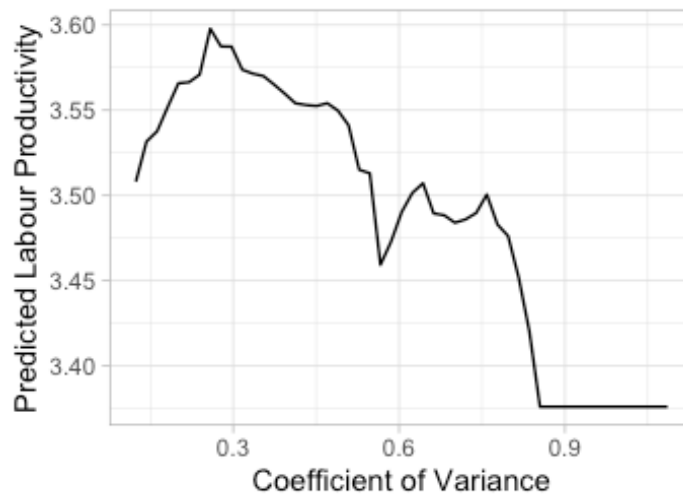


Figure 38: PDP (Coefficient of variance – product and service quality) MQ

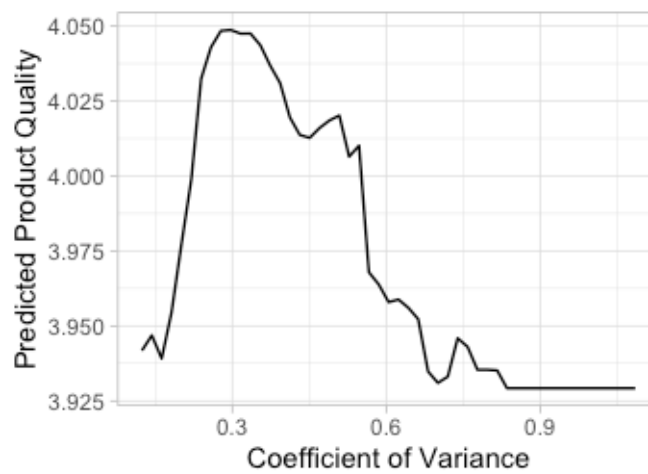


Figure 39: PDP (Gini coefficient – financial performance) FPQ

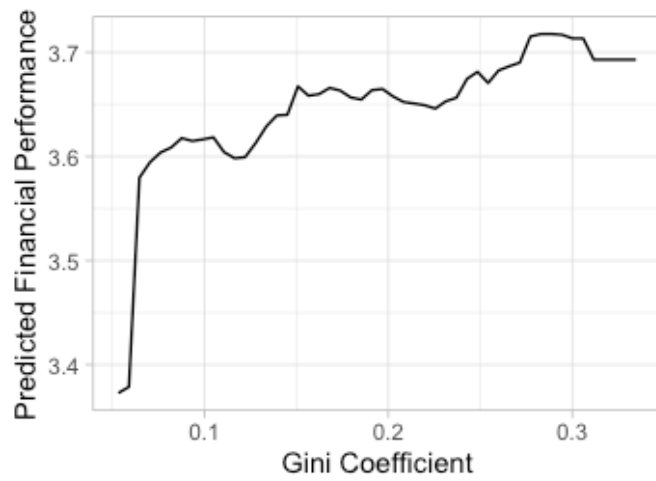


Figure 40: PDP (Gini coefficient – labour productivity) FPQ

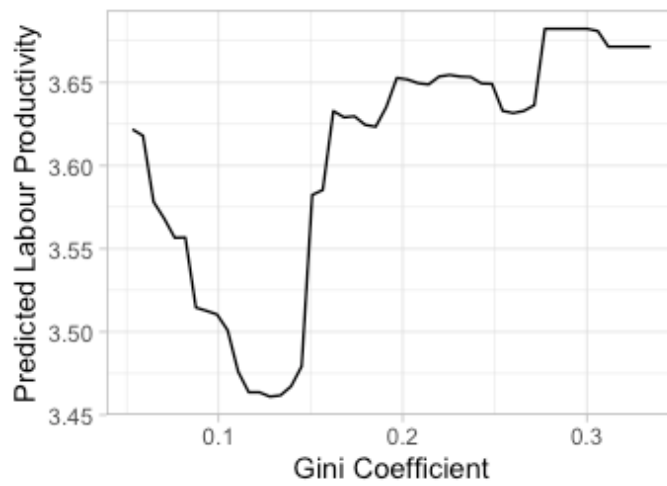


Figure 41: PDP (Gini coefficient – product and service quality) FPQ

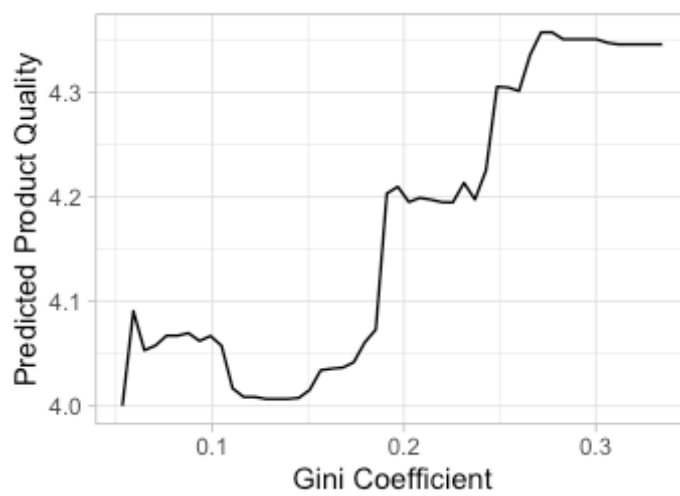


Figure 42: PDP (Coefficient of variance – financial performance) FPQ

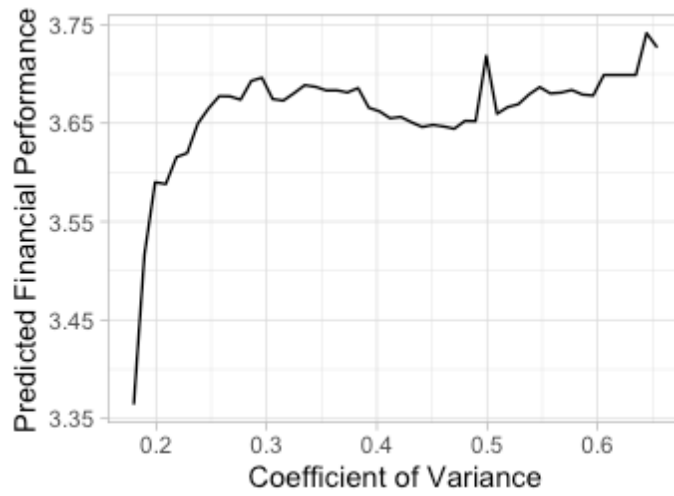


Figure 43: PDP (Coefficient of variance – labour productivity) FPQ

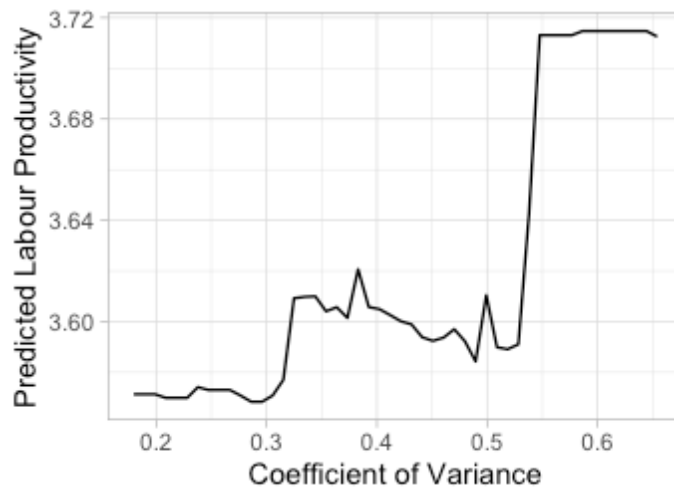
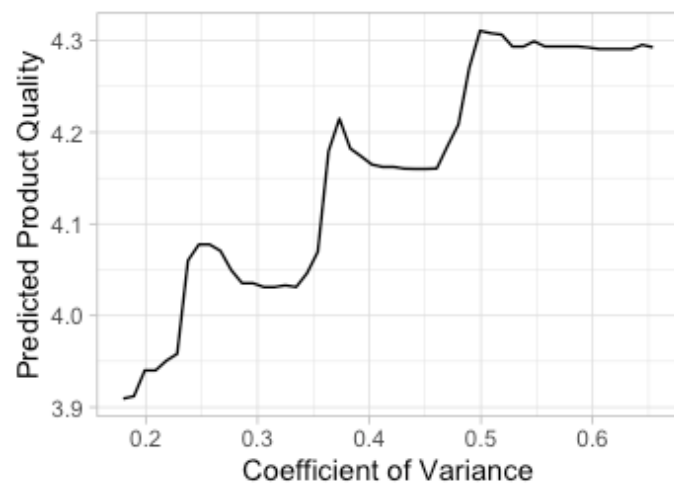


Figure 44: PDP (Coefficient of variance – product and service quality) FPQ



Figures 33 to 35 are PDPs for the relationship between the Gini coefficient and the three perceptual performance measures using the MQ sample. The plots suggest a curvilinear relationship between the Gini coefficient and each perceptual performance measure, with a sharp positive relationship for values of the Gini coefficient between 0.05 and 0.1. The inflection points, after which the relationship is suggested to turn negative vary for each measure. Financial performance is suggested to decrease when the Gini coefficient passes 0.25, product and service quality after 0.15 and labour productivity already after a value of 0.1. Results for the coefficient of variance using the MQ sample mirror those for the Gini coefficient (figures 36 to 38).

The suggested relationships completely change when using the smaller FPQ sample (figures 39 to 44). Results for the relationship between both pay inequality measures and each perceptual performance measures are suggested to be positive.

The results are interesting because whilst the logistic regression models suggested a curvilinear relationship when using the FPQ, though not for the MQ, the opposite holds for the random forest model.

Overall, the results for the relationship between pay inequality and the three perceptual performance measure are inconclusive. Whilst both the linear logistic regression model with a polynomial term and the random forest model suggest a inversely U-shaped relationship between the both pay inequality measures and the perceptual performance measures, the results are sensitive to the chosen sample for both methods, and to the type of inequality measure for the logistic regression models. Hypothesis 4 is thus only partly and conditionally supported when using perceptual performance measures. The effect size is, however, very small, with little differences in the performance outcome across the whole range of the pay inequality measures.

6.4.2 Accounting-based performance measures

As above, the results for the relationship between intra-workplace pay inequality and accounting-based workplace performance measures from the linear regression model will be presented first, before turning to those from the random forest model.

Linear weighted regression model

Results for the relationship between the Gini coefficient and the three accounting-based workplace performance measures are displayed in table 39. Except for regression (5) which included a polynomial term for the Gini coefficient, the linear regression result suggest that all relationships are non-significant. Looking at regression model (5), the positive and significant coefficient for the Gini and the negative and significant coefficient for the Gini-squared suggest and inversely U-shaped relationship between the Gini coefficient and log sales of employees. In other words, first log sales per employees increase with increasing levels of inequality, though after some point any further increase is associated with a decrease in log sales per employee.

Table 39: Regression results for the relationship between the Gini coefficient and accounting-based performance measures

	EBIT			EBIT Ratio			Labour Productivity		
	(1)	(2)	(3)	(4)	(5)	(6)	(4)	(5)	(6)
Gini	4.180 (3.341)	-1.421 (10.185)	1.084 (2.935)	-0,567 (0.523)	-2.837 (2.301)	-0.303 (0.541)	0.716 (1.573)	11.3848* (6.908)	4.936 (6.397)
Gini-squared		7.649 (26.606)			7.581 (5.988)			-32.582* (19.253)	-10.025 (16.870)
Intercept	11.479*** (0.907)	8.554*** (1.442)	8.451*** (1.342)	0.253** (0.098)	0.291 (0.191)	-0.143 (0.202)	11.170*** (0.260)	10.455*** (0.495)	10.004*** (0.576)
Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Observations	187	187	1871	187	187	187	187	187	187
R-squared	0.028	0.032	0.396	0.022	0.024	0.340	0.002	0.028	0.334

Note: * p < 0.05; ** p < 0.01; *** p < 0.001; FPQ weights included

Table 40: Regression results for the relationship between the coefficient of variance and accounting-based performance measures

	EBIT			EBIT Ratio			Labour Productivity		
	(1)	(2)	(3)	(4)	(5)	(6)	(4)	(5)	(6)
Coef.Var.	0.678 (1.993)	14.724** (5.774)	1.091 (6.866)	-0.310 (0.244)	-0.445 (1.147)	-0.151 (0.219)	-0.239 (0.731)	7.508** (3.001)	3.366 (3.769)
Coef.Var. ²		-16.897*** (6.363)	-0.692 (7.635)		0.164 (1.551)			-9.396*** (3.452)	-3.699 (4.176)
Intercept	11.898*** (0.890)	9.402*** (1.30.8)	8.327*** (1.622)	0.277*** (0.102)	0.300 (0.255)	-0.126 (0.212)	11.375*** (0.305)	10.011*** (0.514)	9.863*** (0.654)
Controls	No	No	Yes	No	Yes	Yes	No	Yes	Yes
Observations	187	187	187	187	187	187	187	187	187
R-squared	0.003	0.083	0.396	0.032	0.032	0.342	0.001	0.058	0.334

Note: * p < 0.05; ** p < 0.01; *** p < 0.001; FPQ weights included

The curvilinear relationship between pay inequality and log sales per employee is also suggested to be present when using the coefficient of variance (see table 40 regression model (5)). Compared to the Gini coefficient, for which the results were only significant at a 10-per cent level, there are significant at a 5-per cent level when using the coefficient of variance. Interestingly, the relationship between the coefficient of variance and the EBIT is also suggested to be curvilinear (regression model (2), table 40) and significant at a 5-per cent level.

The regression models with controls explain around 40 per cent of the variation in the EBIT, 34 per cent of the variation in the EBIT ratio and 33 per cent of the variation in log labour productivity.

Overall, the results offer partial support for hypothesis 4 on the inversely U-shaped relationship between intra-workplace pay inequality and employee trust in managers. They are also partly in line with those of the FPQ sample using the perceptual performance measures. Yet, contrary to the results of the perceptual performance measures, in respect to the accounting-based measures, the coefficient of variance, not the Gini coefficient, is suggested to have a significant curvilinear relationship with proxies of labour productivity and financial performance.

Random forest model

Figures 45, 46 and 47, depicting PDPs for the relationship between the Gini coefficient and the three accounting-based workplace performance measures, do not suggest a straightforward relationship. Whilst the relationship between the Gini coefficient and the EBIT is suggested to be negative, those for the EBIT ratio and log sales per employee, i.e. labour productivity, follow an inverse U-shape-like form. In the latter two cases, the relationship is first positive before turning negative after a Gini coefficient of around 0.18 for the EBIT ratio and 0.25 for log labour productivity. The different outcome for the EBIT measures stems likely from the fact that it is not logarithmic. This is because the EBIT had negative values, and the natural logarithm of a negative number cannot be defined. Results for the relationship between the coefficient of variance and the three accounting-based performance measures are in line with those for the Gini coefficient.

Results for the random forest model on the relationship between pay inequality and log sales per employee are in line with those from the weighted linear model, thus supporting hypothesis 4. In comparison to the traditional regression model which did not pick up any significant

relationship between pay inequality and the EBIT ratio, the random forest models suggest a curvilinear relationship between each pay inequality measure and the EBIT ratio.

Figure 45: PDP (Gini coefficient – EBIT)

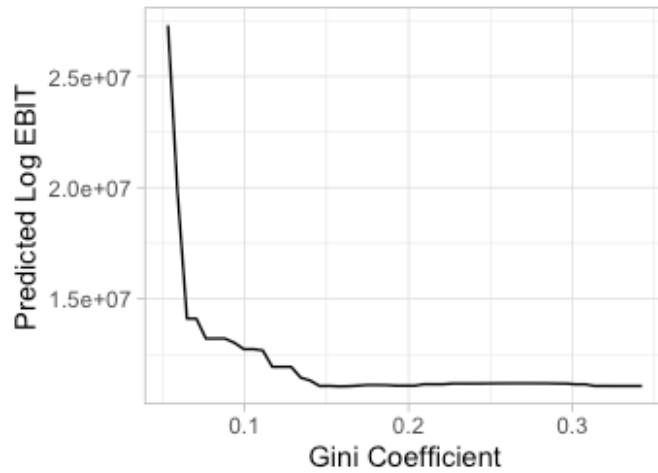


Figure 46: PDP (Gini coefficient – EBIT ratio)

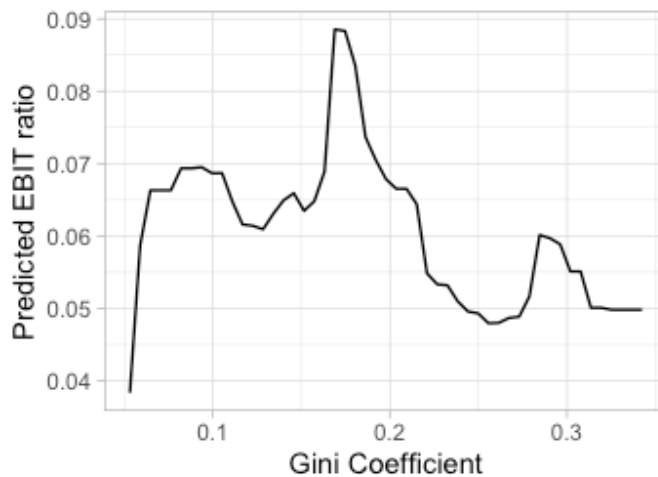


Figure 47: PDP (Gini coefficient – sales per employee)

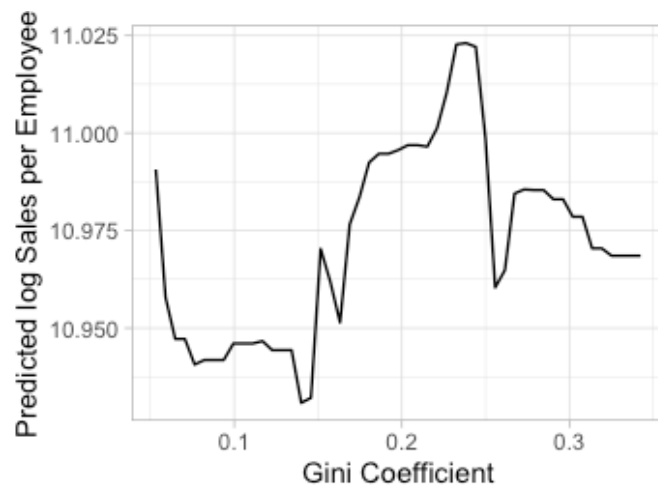


Figure 48: PDP (Coefficient of variance – EBIT)

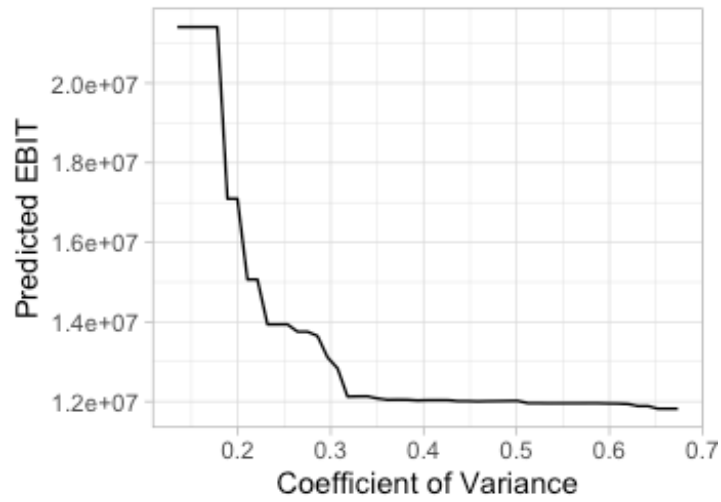


Figure 49: PDP (Coefficient of variance – EBIT ratio)

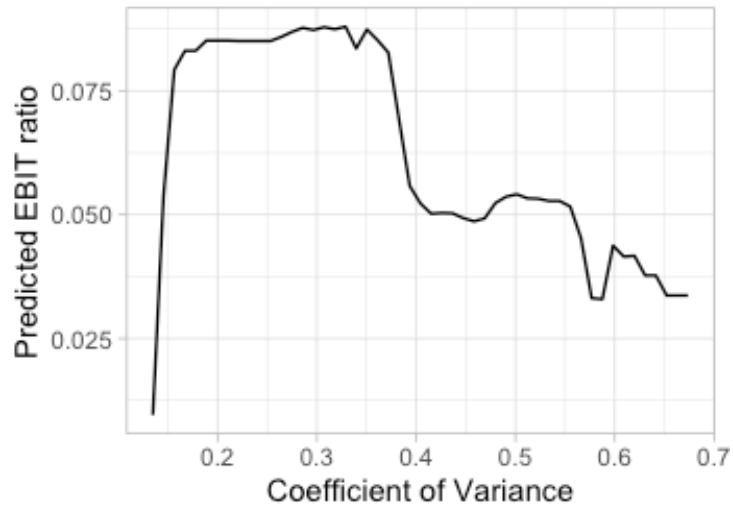
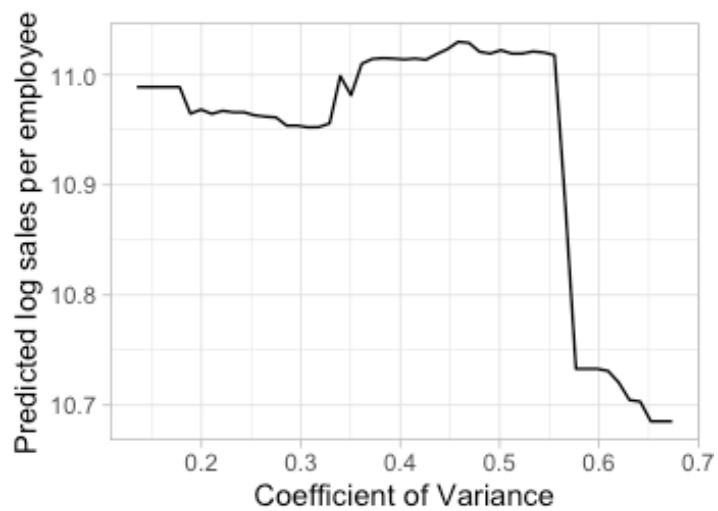


Figure 50: PDP (Coefficient of variance – sales per employee)



6.5 Discussion

In this empirical chapter, I was interested to see whether the conclusions drawn from the inversely U-shaped relationship between intra-workplace pay inequality and fairness perceptions, as well as between pay inequality and trust, also apply to other positive workplace aspect, in this case workplace performance. To investigate this relationship, I used two different types of workplace performance measures – perceptual and accounting-based, two measures of intra-workplace pay inequality – the Gini coefficient and the coefficient of variance and two different samples in case of the perceptual workplace performance measures – one larger sample and one smaller sample that was also used for the accounting-based measures and allowed for the comparison of the two types of measures.

The results suggest the presence of an inversely U-shaped relationship between intra-workplace pay inequality and workplace performance for both types of performance measures, both pay inequality indicators and across both samples. However, the relationship is not consistently found in all regressions. For the perceptual performance measures, the relationship is contingent on the sample used, the type of pay inequality measure and the statistical approach. For the accounting-based measures results from both traditional weighted linear regression models with a polynomial term and from the random forest model suggest a non-linear, inversely U-shaped relationship between intra-workplace pay inequality – both for the Gini coefficient and the coefficient of variance – and log sales per employee, i.e. labour productivity. The random forest models additionally found a clear inversely U-shaped association between both pay inequality measures and the EBIT ratio, suggesting that next to labour productivity, profits in general might be linked to pay inequality in non-linear way. This chapter thus found partial support for the non-linear, inversely U-shaped relationship between intra-workplace pay inequality and workplace performance. Implications for theory, methodology and practice are discussed below.

6.5.1 Theoretical implications

Overall, the findings of the chapter highlight the complexity of determining the direction of the pay inequality – workplace performance relationship. In line with Lazear and Rosen's (1981) tournament theory and Mueller et al.'s (2017) findings for UK firms, the random forest model picked up a positive relationship between intra-workplace pay inequality and three perceptual performance measure, though only for the smaller FPQ sample. When running the same models with the larger MQ sample, the PDPs suggest a clear inversely U-shaped relationship, which

suggest that pay inequality is positively linked to each of the three perceptual performance measures up to a certain point, after which any additional increase in pay inequality is associated with a lower workplace performance. Moreover, when using accounting-based measures, there is no support for a positive relationship found by Muller et al. (2017), though neither for a clear negative relationship as advocated and found by other scholars (Ensley et al. 2007; Faleye et al. 2010; Frederickson et al. 2010; Green and Zhou, 2019; Martins, 2008), but support for the hypothesis developed in this PhD thesis: an inversely-U shaped relationship.

These results are in line with those by Trevor et al. (2011) and Mahy et al. (2011), who also found curvilinear relationships between intra-organisational pay inequality and organisational performance using polynomial terms in a linear regression model. The fact that a non-linear relationship was found for both accounting-based and perceptual measures, using two different types of statistical approaches stresses the robustness of these particular findings, whilst acknowledging that it depends on the measure used. It also chimes with Chi et al.' (2019) results on the inversely U-shaped relationship between pay gaps in individual level performance.

Theoretically, this supports the role of the notion of fairness for intra-workplace pay inequality – workplace performance relationship (Akerlof and Yellen, 1990; Fehr and Schmidt, 1999). Particularly, the finding that measures of labour productivity and of product and service performance are suggested to have a curvilinear relationship with pay inequality, further substantiates the role of individual fairness perceptions. However, rather than positing that pay inequality is in itself unfair, the results suggest that once pay inequality passes a certain level, increases are perceived as unfair. Contrary to Mahy et al. (2011) who argue that the inversely U-shape association highlights that fairness considerations override incentive considerations (tournament theory), the shape rather suggest that fairness is omnipresent in pay inequality reactions. At low levels inequality is perceived as unfair because it does not adequately account for the productivity differences, thus reflecting that further increases in inequality is associated with higher performance. Yet, once pay inequality passes a threshold where pay differences outstrip the productivity differences, it is again perceived as unfair. As a corollary, any further increase in inequality is associated with lower levels of performance. Whilst I do agree with Mahy et al. (2011) and Lazear and Rosen (1981) that upward comparisons can be incentivising, the positive effect, in line with empirical evidence from social comparison research, is again contingent on the inherent fairness of the pay difference between comparing person and the

upward pay referent (De Cremer, 2002; Smith et al., 1994). In other words, fairness considerations are also important for incentives.

According to Adams (1965), employees will try to restore equity in the relationship with their employers/managers when they feel that the ratio between their own inputs and outcomes is worse than those of their peers. The only way for an employee to do immediately is by withholding their own labour effort or by sabotaging the efforts of their co-workers. A fall in both the accounting-based measure of labour productivity and the perceptual measure of product and service quality offer some workplace-level support and add to the employee-level findings by Cohen-Carash and Mueller (2007) and Smith et al. (1994) as well as Collins et al. (2012) and Sieweke et al. (2017) on the relationship between fairness perception and performance. This also indicates that findings from chapter 4 on the relationship between intra-workplace pay inequality and individual fairness perceptions have wider workplace level consequences: product and service quality, and labour productivity.

In line with Bowles and Gintis (1995), this chapter has also offered some evidence for the claim that high levels of pay inequality might not only be considered problematic on moral grounds, but are likely to be labour productivity diminishing, thus presenting an economic reason. This is important because it challenges tournament theory's (Lazear and Rosen, 1981) proposition that higher levels of pay inequality are productivity inducing by creating competition among employees and gives more weight to Lazear's (1989) later argument, that a degree of pay compression is necessary to improve cooperation among employees which is "detrimental" (Lazear, 1989:561) to worker productivity and overall performance. As such, I agree with Brown et al.'s (2001: 17) conclusion that "pay plays a complex part in the productive use of labour and if not managed astutely can be a powerful demotivator".

Whilst the curvilinear relationship between intra-workplace pay inequality and workplace performance received the strongest support among all possible relationships, results in this chapter, in line with Shaw's (2014) conclusion, suggest that the direction of the intra-workplace pay inequality – workplace performance relationship are likely to depend on sample characteristics, type of performance measure and statistical approaches employed.

3.5.2 Methodological Implications

In this chapter, I employed two types of statistical analysis. Next to traditional weighted linear regression models with a polynomial term, I employed more flexible non-linear, machine learning models in the form of random forest analysis. The inclusion of both approaches proved to be interesting, as results showed commonalities for some relationships whilst divergence for others. First, had I not employed random forest models, the suggested non-linear relationships between pay inequality and the perceptual performance measures for the larger MQ sample would have been lost. This is surprising considering that the PDPs suggested the clearest and strongest inversely U-shaped relationships for this sample. It is similarly surprising that the traditional regression models with a polynomial term picked up curvilinear relationships for the smaller FPQ sample, whilst RF models did not. Lastly, both approaches showed convergence in terms of the accounting-based measure labour productivity, thus offering the most robust support for the relationship between intra-workplace pay inequality and labour productivity. Considering that each approach comes with its own assumptions, benefits and caveats, those results receiving support from both approaches are suggested to be most robust.

Previous work referenced in this chapter was based on linear regression model, with very few of them including a polynomial term to test for non-linearity. Future research should make use of different statistical approaches among them machine learning approaches, which are able to identify the complex relationships that this research has identified when investigating phenomena where human beings are central to the outcome.

Next to the two different statistical approaches, this chapter emphasised the different types of workplace performance measures. Despite the fact that subjective measures in the WERS has been widely used (Brown et al., 2009; Bryson et al., 2005; Bryson et al., 2017; Devaro, 2006; Jones et al., 2009; Wood et al., 2012) and defended on the ground that a) the sample size would be greatly reduced, b) financial measures are only available for private workplace, and c) previous studies confirmed the validity of the subjective measures, summary statistics by the previously named studies all point to a much too positive view of managers concerning their performance. The results of this chapter revealed both commonalities and differences between the two types of measures. First, overall, both types of measures offered most support for a curvilinear relationship between intra-workplace pay inequality and workplace performance. Second, employing traditional regression approaches for the same FPQ sample for each type of performance measure suggested similar curvilinear results for the perceptual measure of product and service quality and the accounting-based measure of labour productivity. For the

Gini coefficient there was even some support for the other two perceptual performance measures financial performance and labour productivity, which match results for the EBIT ratio and log sales per employee. This would support arguments that subjective performance measures are adequate to study firm/workplace performance (Forth and McNabb, 2008). On the other hand, results from the random forest model using the same FPQ sample for both types of measures yielded different outcomes: for the subjective measures the relationship was rather positive, whilst it was clearly inversely U-shaped for the accounting-based measures EBIT ratio and log sales per employees, and negative for EBIT. Surprisingly, the results of the RF models did show agreement across the MQ sample for subjective measures and the FPQ sample of accounting-based measures.

In sum, with regard to approaches to measure workplace or firm performance, the findings of this chapter support Forth and McNabb's (2008) conclusion that most weight should be given to those results that are supported by both types of measures.

3.5.3 Practical Implications

The key lesson for managers drawn from this research is that pay inequality needs to be managed properly. First, the relationship between intra-workplace pay inequality and workplace performance is complex, and does, most likely, not follow a linear pattern. There was some limited support for a positive relationship between pay inequality and workplace performance. Yet, a curvilinear relationship received the strongest support, particularly for labour productivity and service and product quality. This indicates to practitioners that pay, in particular relative pay, can be strong motivator for employees in terms of their work effort. Once pay inequality becomes too high and is likely seen as unfair this can, however, result in the opposite: shirking, as economists would label it. In line with recommendations in the previous chapters, these results should highlight to HR managers and practitioners to keep an eye on the level of inequality and on employees' perception of pay inequality.

Chapter 7: Discussion and Concluding Remarks

Income inequality has been increasing in many countries for the past half century. A considerable share of this rise in inequality is based on developments on the organisational level. Inequality, both between and within organisations has increased sharply, often benefitting a minority at the top of the pay distribution whilst the majority has been losing out. On the macro level these trends have been linked to decreasing levels of trust among citizens and in political institutions. This relationship has been theoretically attributed to either the perceived unfairness that goes along with the rising inequality (perception effect) or with a loss of a shared fate and diverging set of values arguably due to a loss of interaction (stratification effect). Yet, how this relationship between pay inequality and trust plays out at the workplace level – the place where people are directly confronted with ratio between their own efforts and returns as well as of those of others; the place where decisions about pay are being made by management; a place of socialisation where people form beliefs about pay inequality for society at large – is still an important unexplored knowledge gap. Do we find similar findings on the workplace level or are the different underlying mechanisms that lead to an entirely different outcome? With the decline of labour unions, and particularly collective bargaining, many workers have been losing a collective voice that tries to establish fairness in both procedures and outcomes and that mediates between employees and managers. As a result, pay inequality in those workplaces without collective bargaining has been on the rise. Investigating these unexplored relationships is important because both fairness and trust have been linked to superior individual and workplace performance.

In light of these important knowledge gaps, this PhD research project set out to find answers to four related research questions:

1. What is the role of intra-workplace pay inequality in employee trust in managers? Does the established negative relationship for the macro-level also hold at the workplace level for interpersonal forms of trust?
2. How do shared values and fairness perceptions relate to both intra-workplace pay inequality and employee trust in managers? Is pay inequality associated with a divergence in values in line with the stratification effect or accompanied by increased feelings of unfairness? Are these two proposed mechanisms mutually exclusive, as suggested in previous research, or potentially interrelated?

3. Considering the important role of labour unions in reducing income and pay inequality by being a voice for workers, what role do they play in the intra-workplace pay inequality – trust relationship?
4. If there is indeed a significant relationship between intra-workplace pay inequality and employee trust in managers, how does this influence our theoretical understanding of the pay inequality – workplace performance relationship?

To empirically answer these questions, I used the 2011 Workplace Employment Relations Study, a large-scale employer-employee matched survey representative of workplaces in Britain. Results of the analyses suggest an inversely U-shaped relationship between intra-workplace pay inequality and employee trust in managers, with an inflection point at a Gini coefficient of around 0.25. In other words, a Gini coefficient of 0.25 is suggested as the optimal level of inequality to achieve the highest level of trust. At lower levels of pay inequality, increases are associated with more trust, whilst when pay inequality passes this threshold of 0.25, any increase is associated with lower trust. The relationship was mediated by perceptions of manager fairness and shared organisational values, with perceived fairness having a positive effect on shared values which in turn positively influence employee trust in managers. Collective bargaining coverage as proxy for collective employee voice moderated the direct relationship between pay inequality and trust, and the mediation relationship between pay inequality and perceived manager fairness mostly positive, but stagnated or slightly decreased at a Gini coefficient around 0.3. These results were found for the complete unweighted sample as well as for a sub-sample of medium and large workplaces including multilevel sampling weights. Lastly, regarding research question 4 and the relationship between pay inequality and workplace performance, findings also suggest an inversely U-shaped relationship. Yet, the results are sensitive to sample size and performance measure.

Detailed implications of these findings for theory, methodology and practices were discussed in each chapter. The following sub-chapters, hence, focus on the overall conclusions that can be drawn from this PhD research, limitations of the research and suggestions for future research.

7.1 Implications of this research

The findings of this PhD research project have contributed to our theoretical understanding of the relationship between pay inequality and trust in several ways. First, results obtained from

the statistical analyses suggest that the association between income inequality and trust on the macro level extends to other levels of analysis and dimensions of trust. Whilst macro level studies focused on trust in strangers (Barone and Mocetti, 2016; Fairbrother, 2014; Graafland and Lous, 2019; Gustavsson and Jordahl, 2007; Larsen, 2013) or trust in political institutions (Belabed and Hake, 2018; Lipps and Schraff, 2020; Schäfer, 2010; Zmerli and Castillo, 2015), this research suggests that pay inequality is also related to interpersonal forms of trust, in this case the trust employees have in their managers using the workplace as a level of analysis. This points to a more universal relationship between these two phenomena. The fact that there is a tipping point after which increases in pay inequality are associated with lower levels of employee trust in management not only supported macro level findings on the negative effect of income inequality on trust but highlighted the complexity of understanding people's perception of and reaction to pay inequality.

This feeds into the second theoretical contribution: our understanding of the theoretical mechanisms that connect pay inequality to trust. In this PhD research, I have gone beyond the application of theoretical mechanism proposed in the income inequality – trust literature by incorporating organisational theories of trust, fairness perceptions and the social exchange in conjunction with interdisciplinary theories of values, inequality and fairness. The starting point and the crucial element that gave rise to this theoretical framework was the critical discussion of existing conceptualisations of interpersonal trust in organisations and the development of my own concept. This development drew heavily from Jones and George's (1998) concept of trust, which stressed the role of shared values, attitudes, moods, and emotions for the trust experience. I hope that this PhD research provides reasons to re-focus the attention of the research on trust community, which has been pre-occupied with Mayer, Davis and Schoorman's (1995) framework, to this more neglected conceptualisation trust. Understanding trust as this ongoing experience between two parties that is constantly re-evaluated through attitudes, moods, emotions and shared values, builds the bridge to existing theories of employee reactions to pay inequality: Adams' (1965) equity theory.

Ultimately, this research theoretically proposed and found empirical evidence for the role of individual *perceptions* of inequality, which are shaped by an individual's underlying value system. These perceptions in turn can, on average, be linked to actual levels of pay inequality. In line with Burkitt (1999) this suggests that people may form social constructs, e.g. perceptions of fairness, *through* means of material artefacts, e.g. actual levels of pay inequality. In short, employees use the material level of pay inequality and deconstruct it socially as, for example, fair or unfair, value-congruent or value-incongruent. The role of values in influencing when

inequality is perceived as fair and when as unfair thus gives support to Elder-Vas' (2012) proposition that social norms that influence how people talk and what they do, are real structures with causal powers. Yet, they are the result of dominant discourses and can therefore be transformed through human agency. These normative forces stress the historical and cultural embeddedness of individual's actions and perceptions in society (Burr, 2015). That some of this unfairness is directed at managers, suggests that employees seem to agree with Bebachuck and Fried's (2003) argument that next to market forces managers have the power to influence the internal pay distribution, and that they need to be aware of employees' sensitivity to relative pay (Brown et al., 2001).

Beyond social norms as real structures with causal powers, the results of chapter 5 on the role of collective bargaining highlight the power of institutional arrangements in shaping perceptions and relationships. The same level of intra-workplace pay inequality may be experienced and perceived differently depending on the institutional features that shape other dimensions of fairness and trust in the social exchange between employees and managers. The findings from this PhD research give support to Kaufman's (2005) claim that labour unions, despite their decreasing presence, are able to establish transparency and procedural fairness through collective labour agreements, which in turn has a positive effect on the relationship between managers and employees both in terms of fairness perceptions and trust. The latter finding is in line with those by Bryson (2001). The potential of ameliorating the negative perception of high level of pay inequality by improving the involvement of employees in the decision-making process as well as the ability to challenge decisions, has not only substantiated robust experimental and case study evidence for the fair process effect (Van den Bos et al., 1999; Van den Bos, 2005) through representative employer-employee matched data for UK workplaces, but has also integrated trade unions as collective employee voice rather than focusing on direct employee voice as is common in the aforementioned psychological literature.

The understanding of when pay inequality is likely to be perceived as negative and when as positive was also evident in the analysis of the much debated pay inequality – workplace performance relationship. Finding evidence for an inversely U-shaped relationship between intra-workplace pay inequality and labour productivity – using both a subjective and objective measure – can be seen as further support for the developed theoretical understanding of equity consideration and how these individual perceptions can have wider organisational implications.

Looking beyond the relationship between intra-workplace pay inequality and employee trust in managers, this PhD has given further empirical support for the interplay of human agency

and structure, of Roy Bhaskar's Transformational Model of Social Activity, which I described in Chapter 2. It stresses the necessity of studying individuals and the relationship between individuals in their institutional and cultural context. For country level studies on the relationship between income inequality and trust this suggests that future research should investigate the moderating role of various institutional arrangements and how these have, also over time, influenced the perception of income inequality and with it the trust people have in others and in political institutions.

Methodologically, the findings of this PhD research project add to our knowledge in two ways. First, the representativeness of the sample used is rather rare in the field of organisational trust, organisational justice as well as organisational performance. Whilst experiments are beneficial in drawing causal inferences, thereby identifying underlying mechanisms, they generally lack generalisability. Similarly, although workplace or industry case studies allow for the use of a detailed survey and primary data collection, they can never rid themselves of limitations of environment contingency. Contrary to this, the 2011 WERS allowed to draw more general conclusions about the fair process effect in a real life setting of employees in workplaces that are representative of the UK workplace population. Although meta-analyses on organisational fairness perceptions and their antecedents and outcomes highlight the cumulative rigor of the studies, representative field data is an important methodological contribution.

Second, this PhD research employed machine learning approaches next to traditional linear regression models in an effort to identify complex non-linear relationships. The application of random forest models changed the conclusions drawn from this research. Had I only relied on non-linear techniques for linear regression models I would have concluded that a) the relationship between intra-workplace pay inequality and employee trust in managers is positive, b) the relationship between pay inequality and perceived manager fairness is positive, and c) collective bargaining positively moderates the relationship between pay inequality and trust as well as between pay inequality and fairness indefinitely. In other words, the application of this more flexible statistical technique made an invaluable contribution not only to this research and the implications drawn from it both for theory and practice, but to our general understanding of how to study complex relationships between people.

Practically, the results suggest several lessons to managers, especially those working in HR. First, managers should keep an eye on pay inequality in their workplace, its current levels and past developments, and compare them to industry standards. Second, managers should have discussions with their employees about their fairness views and monitor those through both staff attitude surveys and institutional channels such as works councils and labour unions. Third, managers should not try to substitute union voice channels for management voice channels, but rather see them as complementary. This will produce the best results in terms of employee-management relationships. Lastly, managers should be aware that inequality and the trust relationship with their employees is likely to influence performance that can be directly linked to employee effort: labour productivity and product and sales quality. An employee who perceives pay, and the treatment of managers as fair, as sharing similar values and as trustworthy are more likely to reciprocate these feelings in terms of superior effort and performance.

7.2 Limitations and Future Research

The strength of this PhD research project are the representative multi-level data and the 2-stage statistical methods that revealed the complex relationship between intra-workplace pay inequality and employee trust in managers. Using a multilevel philosophical stance in combination with multilevel theories, multilevel data and multilevel statistical analysis demonstrated the methodological consistency in approaching this research project. The use of different representative data samples allows for generalisability of the results for the population of medium and large workplaces, thus to external viability. Last, using two different types of statistical methods, one parametric and one more flexible, non-parametric approach, allow for more robust conclusions. Against these strengths, I have to mention several limitations, which simultaneously offer space for future research to increase the robustness, breadth and depths of the findings.

The first limitation relates to the measures used in the empirical analyses. Trust as stressed in Chapter 3 has several dimensions, out of which I focused solely on the positive expectations a trustor holds toward the trustee. Future research should focus on the willingness-to-be-vulnerable component and also include direct questions on trust. Similarly, next to not differentiating between several dimensions – horizontal and vertical – the measure of intra-workplace pay inequality used in this research had a relatively low upper limit of GBP 27.01. The strength of the measure was that it was based on the whole workplace population rather

than a subsample of employees. Yet, it failed to account for the long tail in the pay distribution that captures the increasing pay of top earners. Future research should thus a) use pay data that captures the upper end of the pay distribution better, and b) use other measures of pay inequality such as 90th/10th ratio, the Palma ratio or the Robinhood index. Together with the different dimensions of pay inequality, this will allow to reach better conclusions about the relationship between pay inequality and trust, as well as between pay inequality and employees' fairness perceptions. The mediators used – perceived manager fairness, shared organisational values – were based on single-item measures. Although the general formulation of these measures made them suitable for this project as it was a first exploration, future research should use established multi-item measures that capture the breadth and depths of these concepts.

The second limitation relates to the overall research design. Despite its representative nature and the multilevel structure, the data were cross-sectional. In order to draw any conclusions about causality, future research should focus on two aspects. On the one hand, longitudinal data can help to establish whether changes on inequality and relates to changes in trust and fairness. Quasi-experimental methods such as difference-in-difference approaches to study an intervention that changes the distribution of pay are promising techniques to draw causal inferences. On the other hand, qualitative approaches such as interviews in combination with critical incident techniques or event-based diaries have the potential to shed more light on the underlying causal mechanisms to establish fairness perceptions, such as social comparisons, the process of deciding on shared values, and what it is about manager fairness that elicits more trustworthiness.

The third set of limitations deals with aspects of the theory that demand further testing. For instance, if it is about equity, about the reflection on internal differences in outcomes such as pay, future research should evaluate the moderating role of performance-related pay. Put differently, does performance related pay (PRP) lead employees to view pay inequality as fairer compared to employees in workplaces without PRP, or compared to employees in the same workplaces who are not covered by PRP? Or is PRP based on subjective decisions of managers, and thus seen as less fair? Similarly, how would the relationship turn out in workplaces with complete pay transparency and direct employee voice channels? Do we see that employees view higher pay inequality as fairer or will pay inequality be lower and trust be higher because pay is transparent, and workers have a right to voice their opinions about pay inequality? An analysis of workplaces or firms with complete pay transparency and strong worker democracy could be an interesting case to learn more about the role of transparency and voice for perceptions of fairness and trust. In times of receding labour union influence and the decline

of collective labour agreements, can other employee voice channels fill the shoes and establish transparency, fairness and thus trust⁵? Lastly, despite theoretically stressing the instrumentality of employee voice, empirically I only relied on the level of pay inequality as a proxy. This was adequate considering the objectives of this research but misses out other dimensions of unions effectiveness. Better measures of instrumentality in terms of employees' subjective perceptions, such as Bryson's (2001) two measures of union effectiveness, are needed in future research to explicitly test for the flattening or decreasing levels of trust and fairness in workplaces with collective bargaining.

Next to these open questions and suggestions for future research on the organisational level, the findings from the PhD research have also given rise to the need for further research on the macro level. First, with respect to the direct relationship between income inequality and trust in others, future research should test for non-linearity. Past studies have relied on linear regression methods. Yet, as this research stressed, people's perceptions of income inequality are likely to be non-linear. Second, beyond the direct relationship, future research needs to further, and more directly, investigate the proposed underlying mechanisms. Integrating question on perceived fairness from the World Value Survey and European Value survey into a model with longitudinal data on income inequality and trust, can help to test the fairness perception as a causal mechanism. So far, macro level literature has treated the perception of inequality and the stratification effect as independent from another. This PhD research has laid out an argument for why these two mechanisms might instead be interrelated. To further test this theoretical proposition and substantiate results from this research, scholars can follow different approaches. On the one hand, investigating the relationship between pay inequality, fairness perceptions, and trust in countries with different underlying value orientations can shed more light on the interplay between these phenomena. On the other hand, future research can utilise country level household survey data, which includes questions on values, fairness perceptions, income and trust. Whilst the former approach looks at it from a macro perspective, the latter one does so from a micro perspective. Taken together these two approaches may be

⁵ I did test two direct voice proxies but the results were non-significant. This might be due to measurement issues relating to direct voice measures in WERS. Discussing pay in management-employee meetings does not mean the same as collective bargaining. Having an employee committee and works council also does not mean that aspects of pay fairness are considered in the same way as under collective bargaining agreements.

able to identify the different levels at which values interact with fairness perceptions and income inequality.

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Appendix

Post-hoc tests chapter 3: Homogeneity of residual variance

Figure 1: Fitted vs. residual plot

