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Work Motivation and Incentives in the Public Sector

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Work Motivation and Incentives in the Public Sector

Werkmotivatie en prikkels in de publieke sector

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	Prof.dr. B. Visser
	Prof.dr. H.D. Webbink

Preface

Writing this PhD thesis has been exciting, challenging and, fortunately, also a lot of fun. I enjoyed doing research and I look back at my time at Erasmus University Rotterdam with good memories. However, writing a PhD thesis is not always an easy or smooth process. This thesis being no exception, I would like to take this opportunity to thank a number of people explicitly for their continuous guidance and support.

First and foremost, I would like to thank my supervisor Robert Dur for providing me with the opportunity to pursue a PhD and for his guidance in writing this thesis. Robert, your contagious enthusiasm and your helpfulness certainly made a difference, both for this thesis but also in the way I experienced writing this thesis. Even when you were very busy, your door was always open and I somehow always left your office with renewed inspiration and motivation, for which I am thankful. Moreover, I learned a lot from your comments and from working with you. You showed me what it means to do good research and, just as importantly, how to properly write down the findings.

Second, I would like to thank my other co-authors in this thesis: Margaretha Buurman and Josse Delfgaauw. Josse, I have benefitted greatly from your comments and suggestions during our discussions. Moreover, I had the privilege of being a teaching assistant for your microeconomics course. I really enjoyed our frequent talks on the course material, midterms, teaching in general and I am thankful for being able to share my classroom experiences with you.

Next, I would like to thank Simon Burgess, Bauke Visser, and Dinand Webbink for their willingness to take part in the doctoral committee. In addition, I would like to thank Josse Delfgaauw, Steven van de Walle, and Bas ter Weel for taking part in

the large committee.

Spending all this time on doing analysis or writing up papers can be a lonely task from time to time. Fortunately, I shared an office at campus with Jan Tichem. Jan, we started around the same time as PhD students, which meant we ran into the same kind of difficulties and insecurities that go with writing a PhD thesis. I highly value the many discussions we had about our research topics, about being a PhD student in general, and about nonacademic topics (like our shared passion for motorcycles).

I also had the privilege of sharing a supervisor and an office floor (or two) at H-building with Oke Onemu, Max van Lent, Michiel Souverijn and Heiner Schmittdiel. I really enjoyed our frequent discussions, meetings and lunches. Max and Michiel, at the end of my PhD you became regular and welcome visitors to room H7-16. I really enjoyed our discussions and (y)our 'unique' sense of humor. Heiner, as you know, teaching all day is an exhausting and sometimes ungrateful task. However, the prospect of meeting at the Smitse after class kept me motivated through the day. Of course, by mentioning a number of people explicitly here I fully realize that I fail to do justice to many other people at TI and ESE whom I am thankful for many meetings, talks and discussions.

I also want to thank my family for their love and unconditional support to my studies. Finally, during my first year in Rotterdam I met Aart. Aart, thanks for listening to my many and lengthy stories about research and for helping me forget about research altogether. Your support has been very important to me.

Contents

Chapter 1

Introduction

The public sector makes up for an important part of our economy. According to estimates by the OECD (2008) a large share of the labor force in OECD countries is employed by the public sector.* These public sector workers provide a wide range of goods and services to the public. Examples of services that are publicly provided range from education, health care, transport, garbage collection, to public safety. This large variety in public services suggests that all people, at some point in their lifetime, will either have to deal with or rely on public service. The performance of public sector organizations, therefore, receives considerable attention from the public. Even more so, because public services are paid for by taxes. People expect good services and value for tax money.

The delivery of public goods and services is highly labor intensive. Key to good public services are the efforts and output of public sector workers. However, incentivizing public sector workers to work hard may prove costly and difficult. Performance in the public sector is often hard to measure and verify. This is also reflected in the way performance is assessed in the public sector. Performance assessment in the public sector is relatively rare and, if present, often tied to weak incentives (see Burgess and Metcalfe 1999). As a result, public sector performance relies to a great extent on the intrinsic motivations of the workers employed by the public sector. Learning about the motivations of public sector workers may therefore contribute to

*The OECD estimates that 6 to 29 percent of the labor force in OECD countries is employed in either government or public organizations.

our understanding of performance in the public sector.

This thesis contributes to the growing literature on motivations of workers in the public sector. The first part of this thesis empirically studies differences in motivations between public sector and private sector workers. In particular, we study two closely related topics. We investigate how a worker's altruism and valuation of the mission of the public sector jointly affect the likelihood of public sector employment. Moreover, we examine whether public sector workers rate themselves as more altruistic and lazy as compared to private sector workers. Next, chapter 4 studies the motivations of government workers in particular. It empirically investigates whether government workers are more satisfied with their job when their own mission preferences align with the mission preferences of the politicians in office. In the last part of this thesis we take a somewhat different approach. We investigate one possible way to motivate public sector workers. We conducted a field experiment at a large Dutch school for intermediate vocational education to study whether the provision of performance feedback to teachers can improve the performance of teachers.

The remainder of this introduction proceeds as follows. The next section discusses intrinsic motivation and its consequences for the public sector. Section 1.2 provides a general discussion on feedback and, in particular, the role of feedback as an incentive. Finally, section 1.3 provides a short overview of the chapters in this thesis.

1.1 Motivation in the public sector

Learning about people's motivations is key to understanding any kind of behavior. Every action that is undertaken is a result of a motivation to do so. These motivations may stem from a variety of different sources and occur with different directions and intensities. A classic typology of motivation is given by Ryan and Deci (2000), they make a distinction between intrinsic motivation and extrinsic motivation. A person is considered to be intrinsically motivated when he or she derives pleasure or satisfaction from performing the action itself. In contrast, extrinsic motivations stem from 'separable consequences' of an action such as pressures or rewards. In the

workplace such pressures and rewards may include financial incentives, promotion opportunities, social recognition or praise. The intrinsic motivations of workers are central to the first part of this thesis.

Workers' intrinsic motivations have been intensively studied in a public sector setting. In their seminal paper Perry and Wise (1990) describe the concept of public service motivation. Public service motivation is defined as a "predisposition to respond to motives grounded primarily or uniquely in public institutions and organizations" (p. 368). Perry and Wise propose that people with high public service motivation are more likely to work in the public sector and perform better in a public sector job. They classify three sources of public service motivation: a desire to participate, commitment to a public program, and a desire to serve the public interest. The desire to participate relates to a worker's personal well-being. Fulfilling one's personal needs for an exciting and challenging job or maybe even from concerns about self-image or status. On the other hand, commitment to a public program or a desire to serve the public interest results from a more general care for the well-being of others. This care for the well-being of others has received most attention in the literature on public service motivation (see Perry et al. 2010).

In later studies, public service motivation is often equated with more general feelings of altruism (Rainey and Steinbauer 1999). Altruistic motivations are defined as being "motivated mainly out of a consideration of another's needs rather than one's own" (Piliavin and Charng 1990: p. 30). That is, altruism is a willingness to help others without direct benefits to oneself. Such a willingness to help may originate from feelings of empathy, sympathy, or compassion. Recent economic theories build on these ideas and assume that workers intrinsically care about the public interest (see Tonin and Vlassopoulos 2008 for an overview). A common finding in this rapidly growing literature is that public sector organizations optimally set relatively low wages so as to promote self-selection of motivated workers to the public sector (Handy and Katz 1998, Delfgaauw and Dur 2007). In these models workers' care for the public interest usually stems from altruism; either pure altruism or impure altruism (see also Andreoni 1990 for a discussion on altruism). Workers motivated by an impure form of altruism intrinsically care for their own contribution to the

public interest; these workers enjoy a 'warm glow' of contributing. On the other hand, workers may also be motivated by a pure form of altruism. Workers motivated by purely altruistic motives care for the public interest per se; these workers value the total contribution to the public interest. Purely altruistic workers will take into account that when they do not contribute to the public interest themselves other workers will step in and take their place.

Another important, and closely related, strand of literature studies mission motivation of workers. Many organizations have a specific mission. An organization's mission describes the purpose and the objectives of an organization. For organizations in the public sector, the organization's mission makes clear how the public organization contributes to the public interest. Besley and Ghatak (2005) develop a model where workers differ in their mission preferences; that is, workers differ in their appreciation of the organization's mission. They show that there is a premium on the matching of mission preferences between a worker and employer, implying that workers sort to organizations they share a mission with. A number of studies have experimentally investigated the role of mission preferences (Tonin and Vlassopoulos 2010, 2012, Gerhards 2012, Carpenter and Gong 2013, and Fehrler and Kosfeld 2014). A common finding is that participants with matching mission preferences exert more effort as compared to participants with nonmatching mission preferences. Moreover, in line with the studies above, sorting of mission motivated workers can be promoted by offering a relatively low base wage.

1.2 Feedback as an incentive

Many supervisors collect information about the performance of their workers. This information is used to assess the past performance of employees and also as an input to improve future performance of employees. Performance information is often provided to an employee as informal feedback or as formal feedback during a performance appraisal. The last part of this thesis studies the effect of receiving performance feedback on the performance of workers. Performance feedback is defined as "actions taken by (an) external agent(s) to provide information regarding some

aspect(s) of one's task performance" (Kluger and DeNisi 1996: p. 255). Learning about past performance may matter for future performance when workers either intrinsically or extrinsically care about their performance (e.g. as a result of intrinsic motivation or incentive schemes). The effectiveness of feedback as a way to improve performance is heavily debated among psychologists and business administration scholars. In their overview and meta-analysis of the psychology literature Kluger and DeNisi (1996) find that receiving performance feedback has a positive effect on performance in only two thirds of all surveyed studies. Likewise, Alvero et al. (2001) find that studies in business show no uniformly positive effect of receiving feedback on performance. In an attempt to explain these mixed findings Alvero et al. (2001) emphasize the role of the source (e.g. manager or researcher), medium (e.g. verbal or written), and the content of the provided feedback.

In many organizations feedback is provided as relative performance feedback. Relative feedback contains information about a worker's performance relative to a preset goal or relative to the performance of peers. Receiving relative performance information may matter for workers' performance when workers care about their status or social recognition (Moldavanu et al. 2007, Besley and Ghatak 2008, Auriol and Renault 2008) or when workers want conform to social norms (Bernheim 1994). A number of studies experimentally show that relative performance feedback has a positive effect on performance (Azmat and Iriberri 2010, 2014, Blanes i Vidal and Nossol 2011, Kuhnen and Tymula 2012, Tran and Zeckhauser 2012, Delfgaauw et al. 2013, Gerhards and Siemer 2014). However, Barankay (2012) and Bandiera et al. (2013) find that receiving relative performance feedback can backfire.

1.3 Overview of the thesis

This section provides a short overview of the research in this thesis. The first part of this thesis studies differences in motivations between public sector and private sector workers from different angles. In chapter 2 my co-author and I study how a worker's altruism and valuation of the public sector's mission jointly affect the likelihood of public sector employment. First, we construct a simple theoretical framework

building on the model by Besley and Ghatak (2005). In our model workers differ in their willingness to serve the public interest (altruism) and their valuation of the mission of the public sector (mission alignment). We predict that a worker's altruism and mission alignment are mutually reinforcing forces. Altruistic workers are more likely to be employed in the public sector when they feel that the public sector's mission serves the public interest and less likely when they feel that the public sector's mission harms the public interest. Likewise, workers with aligned mission preferences are more likely to be employed in the public sector when altruistic and less likely when spiteful.

We test our predictions using survey data from the World Values Survey. We estimate how workers' altruism (as measured by their willingness to help others) and their mission alignment (as proxied by their confidence in political parties) jointly affect their likelihood of public sector employment. Our data contain a broad range of countries, ranging from wealthy countries in North America and Europe to developing countries in Asia, South America, Africa, and the Middle East. This large range of countries and corresponding public sector missions is particularly well suited to test our joint predictions on altruism and mission alignment. Our key contribution is that we treat altruism and mission alignment as distinct characteristics. Wright (2007) also empirically studies mission motivation of public sector workers, but as a substitute rather than a complement to altruism. A caveat of our analysis, one that we share with previous studies, is that we cannot distinguish whether our results follow from self-selection into the public sector or from adaptation of preferences by working in the public sector.

Closely related, we study differences in altruism and laziness between public sector and private sector workers in chapter 3. Theoretical studies have shown that it can be optimal to provide weak incentives to motivated workers in the public sector so as to extract rents (Besley and Ghatak 2005, Delfgaauw and Dur 2007, Francois 2007). However, providing weak incentives to public sector workers may also attract lazy people to the public sector (Delfgaauw and Dur 2008). We contribute to the literature in two ways. First, we construct a theoretical model of sorting to the public sector where workers differ in their altruism and laziness. Our model predicts

an interaction between a worker's altruism and laziness. The likelihood of public sector employment increases with a worker's altruism, and increases or decreases with a worker's laziness depending on his altruism.

Second, we empirically test these predictions using survey data on German workers. We estimate how the likelihood of public sector employment depends on a worker's self-reported altruism and laziness. Additionally, we explore whether existing sorting patterns are the result of self-selection at the start of workers' careers or whether sorting patterns are more or less pronounced for experienced workers. Sorting may be related to work experience for two possible reasons. First, at the start of workers' careers they may be holding jobs that are a bad match with their tastes and abilities (see Johnson 1978, Jovanovic 1979, and Neal 1999). Second, workers' preferences may adapt to experience as a result of organizational socialization (Brewer 2008). We examine these issues by investigating differences in altruism and laziness at different points of workers' careers and by looking at the first job choice at the start of a worker's career.

Chapter 4 studies the motivations of government workers in particular. Government organizations make up for an important part of the public sector. These organizations carry out tasks on behalf of the government in office. The objectives of government organizations are described in the mission of the government. After an election, with a change in government, the elected politicians set this mission. However, government workers may differ in their valuation of the government's mission. Besley and Ghatak (2005) formalize this idea and assume that workers differ in their mission preferences, they predict a 'mission' premium on the matching of mission preferences between a worker and employer. In this chapter, I empirically investigate whether government workers whose mission preferences match those of the politicians in office are more satisfied with their job as compared to government workers whose mission preferences do not match.

The data used in this chapter come from the Longitudinal Internet Studies for the Social sciences. My data contain survey data on Dutch workers, covering their sector of employment, job satisfaction, and political preferences. A worker's mission alignment with the mission of the government is measured by looking at reported

voting in parliamentary elections. A worker is considered as a match when a worker voted for one of the parties that has taken up office after the election. Reversely, a worker is classified as a mismatch when a worker voted for a party that did not take up office after the election. My key contribution in this chapter is that I use variation in mission alignment over time within the individual. I exploit the fact that after an election, with a change in government, the new politicians in office set new objectives for the government sector. This can be interpreted as an exogenous shock to a worker's mission match. Related studies on 'mission alignment' have mainly used cross sectional variation in mission alignment (Bright 2008, Steijn 2008, Taylor 2008, and Wright and Pandey 2008).

In addition, I study whether my results are robust when I take all political parties in a coalition into account. The government in office in the Netherlands usually consist of a coalition government. This implies that even when a worker's preferred party (as measured by their vote in parliamentary elections) takes up office, it is still possible that this party will form a coalition with parties that conflict with a worker's mission preferences. I investigate this issue using data on a worker's reported stance towards each individual political party.

The final study in this thesis is devoted to the education sector. Education is an important service that is provided mainly by the public sector. Since education is heavily labor intensive the performance of teachers may play an important role in achieving high quality education for students. In chapter 5 my co-authors and I study whether receiving performance feedback has an effect on the performance of teachers. To do so, we conducted a field experiment at a large Dutch school for intermediate vocational education. Teachers' performance was measured by students' evaluations of teachers. A randomly chosen group of teachers was provided with their outcomes of these students' evaluations. We determine the effect of receiving feedback by having all teachers evaluated once more a year later. In total, we collected two waves of student evaluations (before and after providing teachers with feedback) containing 15 thousand evaluation questionnaires covering 242 teachers.

We also study whether the content of the feedback matters for the effect of receiving feedback. Teachers were asked to give a self-assessment of their performance

both before and after receiving feedback. This allows us to uncover whether teachers actually learned something new from the students' feedback and whether the feedback has an effect on the teachers' self-assessment of performance. Additionally, we study whether teachers respond differently when they learn from the feedback that they perform better than their team or when they learn that they perform worse than their team.

Finally, chapter 6 provides a summary of the studies in this thesis and offers some directions for further research.

Chapter 2

Working for a Good Cause

Joint with Robert Dur[1]

2.1 Introduction

Many jobs in the public sector involve tasks that help people in need or contribute to society at large. Such jobs presumably are attractive to people with strong altruistic motivations. A rich literature in public administration has provided empirical evidence in line with this idea. Using a variety of data and methods, it has been shown that public sector employees are more inclined to help others or serve the public interest as compared to private sector employees (see Perry et al. 2010 for a recent overview of the literature).

Inspired by these findings, a theoretical literature has recently emerged in economics studying the sorting of differently motivated people into the public sector and the consequences of this for optimal pay policies and organizational design (see Francois and Vlassopoulos 2008 for a survey). A prominent study in this field is Besley and Ghatak (2005). In their model, workers are heterogeneous in 'mission preferences'; that is, workers differ in what they consider to be a good cause. Besley and Ghatak show that there is a premium on matching of mission preferences, implying that workers will sort to organizations they share a mission with.

[1] A slightly adapted version of this chapter is published in *Public Administration Review* (2014) Vol. 74(2): 144-155.

Concurrently and independently, a new strand in the public administration literature has emerged that, like Besley and Ghatak (2005), stresses 'mission matching' or 'value congruence'. Inspired by the organizational psychology literature on person-organization fit (Kristof 1996), several recent studies show that public sector employees who have a strong willingness to do something useful to society and, in addition, find the work that they do valuable for society report higher job satisfaction and a stronger willingness to exert high effort (see Bright 2008, Steijn 2008, Taylor 2008, Wright and Pandey 2008, and Leisink and Steijn 2009).

This chapter contributes to these literatures in two ways. First, building on Besley and Ghatak (2005), we develop a simple model of sorting into the public sector in an economy populated by agents who differ in both altruism and mission preferences. We examine how an individual's altruism and the alignment of his mission preferences with the public sector's mission affect the likelihood of being employed in the public sector. Our model predicts that altruism and mission alignment are mutually reinforcing. When a worker's mission preferences are well in line with the mission of the public sector, the likelihood of working in the public sector increases in the worker's altruism. The reverse holds when a worker's mission preferences conflict with the mission of the public sector. Altruism does not affect sorting of people who feel that the public sector neither serves nor damages the public interest. Likewise, mission alignment increases the likelihood of working in the public sector for altruistic people, but decreases it for spiteful people.

Our second contribution is to test these predictions using survey data covering employees in both the public sector and the private sector in a broad range of countries around the world. The existing studies that we mentioned above on person-organization fit have used survey data on public sector employees only and have been restricted to well-developed countries, in particular the United States and Western European countries. We use data from the World Values Survey conducted between 2005 and 2008. Our sample contains representative data on more than 30,000 workers from 50 countries, ranging from wealthy countries in North America and Europe to developing countries in Asia, South America, Africa, and the Middle East. Such a broad range of countries and corresponding public sector missions

is particularly well suited to test our predictions on the mutually reinforcing relationship between worker's altruism and mission alignment. We measure a worker's altruism by his response to the survey question: "It is important to this person to help the people nearby; to care for their well-being". Mission alignment is proxied by the worker's stated confidence in political parties. Further, we observe each worker's sector of employment (either government and public institutions or private business and industry) and a rich set of individual characteristics (age, gender, education, and country of residence).

The results of our empirical analysis are well in line with our theoretical predictions. We find clear evidence that altruism and mission alignment are mutually reinforcing in determining a worker's likelihood of working in the public sector. The marginal effect of a worker's confidence in political parties on the probability of working in the public sector is insignificant and close to zero for workers in the lowest altruism categories, but significant and positive for workers in the highest altruism categories. In other words, mission alignment only affects sector choice when the worker is sufficiently altruistic. Likewise, the marginal effect of a worker's altruism on the probability of working in the public sector is strongly increasing in the worker's confidence in political parties. Together, these findings imply that only those workers who exhibit both sufficient altruism and sufficient confidence in political parties are significantly more likely to end up working in the public sector. The total effect ranges up to an additional 6.5 percentage points as compared to the predicted probability of working in the public sector for an average worker of 25.5%. Neither workers with high altruism and weak confidence nor workers with low altruism and strong confidence show a significantly higher likelihood of working in the public sector as compared to an average worker. In contrast, workers with low altruism and weak confidence are significantly less likely to work in the public sector; the probability is up to 4.1 percentage points lower as compared to an average worker.

Our results differ to some extent between workers from well-developed countries as compared to workers from less-developed countries. In well-developed countries, altruism is somewhat more important and confidence in political parties is some-

what less important for the likelihood of working in the public sector. The interaction effect between altruism and confidence is slightly smaller as compared to the full sample estimation, indicating that the mutually reinforcing relation between a worker's altruism and confidence is slightly weaker in well-developed countries. In less-developed countries, confidence in political parties is more important than altruism for the likelihood of working in the public sector. Moreover, we find that the mutually reinforcing relation between altruism and confidence is especially strong in these countries, suggesting that the alignment of mission preferences is more important in less-developed countries as compared to well-developed countries.

Previous research has shown that altruism or 'public service motivation' is a better predictor of public sector employment for higher educated workers (Lewis and Frank 2002). We find the same pattern in our data for altruism and confidence and, particularly, for the interaction between these two. Interestingly, and in contrast to our full sample, we find some indications for spite among respondents in the lowest altruism category.

While our main motivation is to contribute to the body of knowledge about the nature of motivations of public sector employees, we believe that our study (and studies like ours) serve a broader purpose. First, learning about the motivations of public sector employees can contribute to a better understanding of organizational performance in the public sector. Performance of public sector organizations depends considerably on the motivations of their workforce because production is highly labor intensive. Moreover, public sector organizations make relatively little use of extrinsic incentives for workers, such as pay-for-performance and steep wage-tenure profiles (see, e.g., Burgess and Metcalfe 1999), rendering intrinsic motivations of workers even more important than in the private sector. Second, learning about public sector employees' intrinsic motivations can be useful for policy makers as this information may help to design more effective HR policies. These policies may address moral hazard issues, but also adverse-selection issues. For instance, the results of studies like ours may convince organizations to rely less on self-selection of workers and to spend more on the use of selection tools such as personality tests to filter out job candidates with undesirable motivations.

We proceed as follows. The next section gives a brief overview of related literature. In section 2.3, we develop a simple model and formally derive predictions. Section 2.4 describes the data set and explains our empirical strategy. Section 2.5 describes and discusses the main results of the empirical analysis. Section 2.6 concludes.

2.2 Related literature

A formalization of intrinsic motivation to work in the public sector lies in the concept of public service motivation. Perry and Wise (1990) gave the first comprehensive overview of this concept and define public service motivation as "an individual's predisposition to respond to motives grounded primarily or uniquely in public institutions and organizations" (p. 368). They propose that workers with high public service motivation are more likely to end up in a public sector job and will perform better in such a job. Public service motivation is often equated with a desire to serve the public interest or, more generally, with altruism. Rainey and Steinbauer (1999) define public service motivation as a "general altruistic motivation to serve the interests of a community of people, a state, a nation or humankind" (p. 23). We use their concept of public service motivation.

Recent theoretical research in economics builds on these ideas and assumes that some workers in the economy intrinsically care about serving the public interest. In these studies, worker's care usually stems from altruism, be it pure or impure (Handy and Katz 1998, Francois 2000 and 2007, Glazer 2004, Besley and Ghatak 2005, Prendergast 2007, Delfgaauw and Dur 2008, Nyborg and Brekke 2010, Ghatak and Mueller 2011, and Buurman and Dur 2012). A common finding in this rapidly growing literature is that public sector organizations optimally set relatively low wages so as to promote self-selection of altruistic workers.

Empirical studies on differences in workers' motivation between the public and private sector have mainly used data from the US and Western Europe. Studies using data on self-reported motivation and preferences almost invariably find that, as compared to private sector workers, public sector workers have a stronger willingness

to serve the public interest, to help others, and to make personal sacrifices in order to do so (Rainey 1982, Crewson 1997, Houston 2000, and Lewis and Frank 2002). Other studies examine differences in self-reported pro-social actions. Brewer (2003) and Houston (2006) find that public sector workers are more inclined than private sector workers to participate in pro-social activities such as volunteering, donating blood, and taking part in nonpolitical civic affairs. Jacobsen et al. (2011) and Buurman et al. (2012) explore revealed preferences data and find that public sector workers are more likely to make a donation to charity than observationally equivalent private sector workers, particularly at the start of their career. Lastly, Gregg et al. (2011) use British panel data and find that workers who are more inclined to donate labor in the form of unpaid overtime are more likely to sort to the not-for-profit sector. This effect is strongest for industries with caring features such as health, education, and social care.

Few studies have examined whether these results generalize to less developed countries. Serneels et al. (2007) show that intrinsic motivation to 'help the poor' is among the most important determinants of nursing and medical student's willingness to work in the relatively underprivileged rural areas in Ethiopia. Serra et al. (2011) use both survey and lab-experimental data and show that pro-socially motivated health professionals in Ethiopia are more likely to work in the nonprofit sector. Lastly, Norris (2003) and Vandenabeele and Van de Walle (2008) use survey data from the International Social Survey Program and show that public sector workers score higher on altruistic attitudes than their private sector counterparts in all world regions except Asia.

Our key innovation as compared to the existing literature is to treat altruism and mission alignment as distinct characteristics. A few empirical papers in public administration have studied 'mission motivation' of employees, but as a substitute rather than as a complement to altruism (Wright 2007). Closest to this chapter are Bright (2008), Steijn (2008), Taylor (2008), Wright and Pandey (2008), and Leisink and Steijn (2009). Inspired by the organizational psychology literature on person-organization fit (Kristof 1996), these studies show that public sector employees experience higher job satisfaction, have stronger willingness to exert effort on

the job, and are more inclined to stay in their job if they find it important to do something useful to society and, in addition, find the work that they do useful to society. Unlike these studies, our data cover employees in both the public sector and the private sector, which allows us to study the issue of sorting to the public sector in a much more comprehensive way.

Upon completing the first draft of this chapter, we became aware of two other closely related papers. First, Cowley and Smith (2014) use data from the same wave of the World Values Survey as we use to study the relation between corruption in a country and the sorting of intrinsically motivated workers to the public sector. They find evidence that the difference in intrinsic motivation between public and private sector workers in a country decreases with government corruption (appropriately instrumented). Second, Houston (2011) uses data from the International Social Survey Programme and shows that the desire to help others is significantly less prevalent among government workers in Anglo-Saxon welfare regimes as compared to Scandinavian welfare regimes. A key difference between these studies and our study is that we use an individual-level variable for a worker's alignment with the public sector's mission, rather than a nation-specific indicator for all workers in a country.

2.3 Theoretical framework

To fix ideas, we develop a simple model building on the influential paper by Besley and Ghatak (2005). In our model, people are heterogeneous in two ways: they differ in their willingness to serve the public interest (or altruism), denoted by $\gamma_i \in [\underline{\gamma}, \overline{\gamma}]$, and in their valuation of the mission of the public sector (or mission alignment), denoted by $\beta_i \in [\underline{\beta}, \overline{\beta}]$. Both characteristics are an individual's private information and are drawn from a continuous distribution. Altruism is impure; that is, individuals care about their personal contribution to the public interest, not about the public interest per se.[2] Both γ and β can take positive and negative values. A

[2] See Tonin and Vlassopoulos (2010) for field-experimental evidence supporting this assumption and Andreoni (1990) for an extensive discussion of pure and impure altruism. Piliavin and Charng (1990) provide a useful overview of the literature on altruism in all branches of the social sciences.

negative γ implies that a worker is spiteful; such a worker would rather harm than serve others.[3] A negative β implies that a worker's mission preferences conflict with the mission of the public sector; that is, this worker feels that the mission of the public sector harms rather than serves the public interest.[4]

The economy consists of two sectors: a public sector and a private sector. The private sector is perfectly competitive and neither γ nor β matters in any way, such that people who choose to work in the private sector obtain the same utility, given by $\overline{U}$. The public sector offers a wage w and, in addition, yields some nonpecuniary payoff to workers depending on their γ and β. The utility from working in the public sector is given by:

$$U_i = w + \gamma_i \beta_i - \varepsilon_i.$$

The interaction term $\gamma_i \beta_i$ parsimoniously captures the idea that altruistic workers ($\gamma_i > 0$) only derive some additional nonpecuniary utility from working in the public sector when they feel that the public sector's mission contributes to the public interest ($\beta_i > 0$).[5] The stochastic term ε_i captures all other possible characteristics that may affect an individual's relative preference for the public sector. We assume that ε is drawn from a distribution with CDF $F(\varepsilon) = \Pr(\varepsilon_i \leq \varepsilon)$, PDF $f(\varepsilon) > 0$, and boundaries $\varepsilon \in [\underline{\varepsilon}, \overline{\varepsilon}]$, such that there is some variation in most preferred sector for each worker type $\gamma_i \beta_i$.

A utility maximizing worker joins the public sector when the utility from doing so is higher than the utility from working in the private sector. The proportion of

[3] Lab experimental evidence shows that, while altruism is much more prevalent, a substantial fraction of people is spiteful (Andreoni and Miller 2002, Beckman et al. 2002, Falk et al. 2005, and Fehr et al. 2013).

[4] A key difference between Besley and Ghatak (2005)'s model and our model lies in the type space. While their economy consists of selfish and mission motivated workers, in our model workers are distributed continuously along two dimensions: altruism and mission alignment.

[5] We implicitly assume that workers have little or no discretion on the job and so take the public sector's mission as given. Prendergast (2007) and Buurman and Dur (2012) study sorting when workers have more leeway, which may result in bifurcated self-selection. Further note that endogenous effort choice by workers need not change any of our conclusions. For instance, a model where utility from working in the public sector is given by $U_i = w + \gamma_i \beta_i e_i - \frac{1}{2} e_i^2 - \varepsilon_i$ (where e_i is worker i's effort choice) produces exactly the same predictions as long as the public sector imposes a strictly positive minimum effort requirement (which seems reasonable).

workers of type $\gamma_i\beta_i$ choosing public sector employment is given by:

$$\Pr[\varepsilon_i \leq w - \overline{U} + \gamma_i\beta_i] = F(w - \overline{U} + \gamma_i\beta_i).$$

It immediately follows that the likelihood of public sector employment increases in workers' altruism for workers who feel that the public sector serves the public interest ($\beta > 0$):

$$\frac{\partial F(\cdot)}{\partial \gamma_i} = \beta_i f(w - \overline{U} + \gamma_i\beta_i).$$

Conversely, for workers who feel that the public sector harms the public interest ($\beta < 0$), the likelihood of working in the public sector decreases in the workers' altruism. Altruism has no effect for workers who are indifferent about the public sector's mission ($\beta = 0$).

Likewise, it follows that an increase in workers' mission alignment increases the likelihood of working in the public sector for altruistic workers ($\gamma > 0$), decreases it for spiteful workers ($\gamma < 0$), and leaves it unaffected for selfish workers ($\gamma = 0$):

$$\frac{\partial F(\cdot)}{\partial \beta_i} = \gamma_i f(w - \overline{U} + \gamma_i\beta_i).$$

Summarizing, our model thus yields the following key predictions:

Prediction 1 *An increase in workers' altruism (γ) increases the likelihood of working in the public sector for workers who feel that the public sector serves the public interest ($\beta > 0$), decreases it for workers who feel that the public sector harms the public interest ($\beta < 0$), and leaves it unaffected for indifferent workers ($\beta = 0$).*

Prediction 2 *An increase in workers' mission alignment (β) increases the likelihood of working in the public sector for altruistic workers ($\gamma > 0$), decreases it for spiteful workers ($\gamma < 0$), and leaves it unaffected for selfish workers ($\gamma = 0$).*

The resulting predicted probabilities of working in the public sector are depicted in Figure 2.1.[6] The model predicts that workers who are highly altruistic and whose

[6] In Figure 2.1 the stochastic term ε is assumed to follow a continuous uniform distribution. The figure looks similar with other distributions as long as second-order effects through $f'(\cdot)$ are

mission preferences are strongly aligned with the public sector's mission are overrepresented in the public sector. The same is true for workers who are highly spiteful and feel that the public sector damages the public interest. Highly altruistic workers with mission conflict and highly spiteful workers with mission alignment are underrepresented in the public sector.

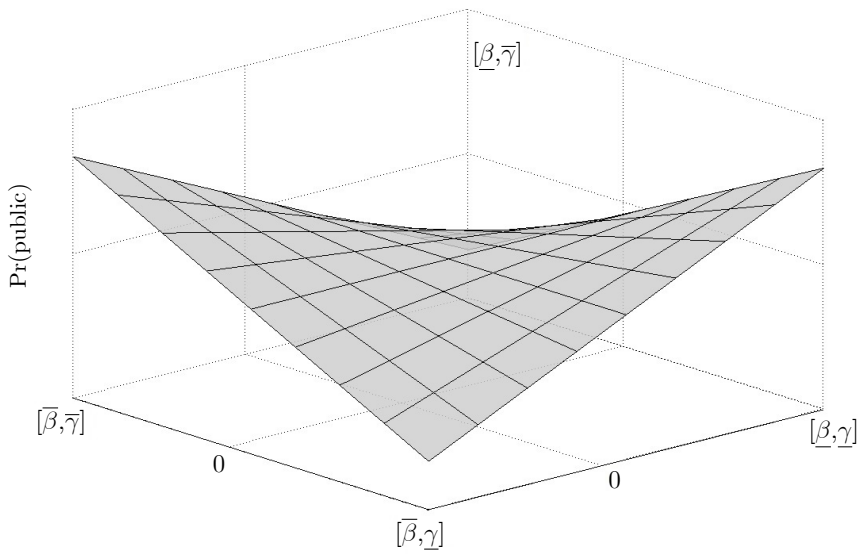

Figure 2.1: Predicted probabilities of working in the public sector

not dominant.

2.4 Data and empirical strategy

We test our key predictions using data from the World Values Survey, conducted by the World Values Survey Organization (2009). This survey consists of several waves, starting in 1981. We use data from the 2005-2008 wave that contains one year of observations for each country.[7] The total number of respondents is 82,992. Respondents answered questions on a wide range of topics, including social, cultural, and political attitudes and a large set of demographics. Questionnaires were carried out face-to-face with the exception of Japan and Australia where paper-and-pencil questionnaires were administered. The range of countries is very diverse, ranging from wealthy OECD countries to less-developed countries in South America, Asia, Africa, and the Middle East.

Our key variables of interest are stated altruism, confidence in political parties, and sector of employment. The survey contains the statement "It is important to this person to help the people nearby; to care for their well-being" and respondents were asked to score themselves on a six-point scale ranging from "very much like me" to "not at all like me". We use this as a measure of altruism.[8] Unfortunately, our data set does not allow us to construct a multi-item measure of altruism that would be psychometrically preferable (see Gosling et al. 2003 for a discussion of pros and cons of single-item measures).

Furthermore, respondents were asked to score their confidence in political parties on a four-point scale ranging from "a great deal" to "none at all". We use this as a proxy for the worker's valuation of the mission he contributes to when working in the public sector. Thus, we assume that workers with high confidence in political parties feel that they contribute to a good cause by working in the public sector, while this holds to a smaller extent for workers with less confidence. We readily admit that this is not an ideal measure of mission alignment, as political parties are

[7] Previous waves are excluded from the analysis because these waves do not contain questions on altruism and sector of employment.

[8] Ideally, the question would not refer to "people nearby" but, more generally, to "people". Care for people nearby is a good proxy for care for people more generally if these measures for altruism are positively correlated. We examined data from the General Social Survey and indeed find a strong positive correlation between "I would rather suffer myself than let the one I love suffer." and "Personally assisting people in trouble is very important to me.".

an important but certainly not the sole determinant of the public sector's mission. Miller (1974a and 1974b) provides an interesting discussion of the relation between public policy and political trust. Quite close to our premise, he describes political trust (of which confidence in political parties is an important component) as "the belief that the government is operating according to one's normative expectations of how a government should function." (Miller 1974b: 989).[9]

Note that our data do not allow us to distinguish spiteful ($\gamma < 0$) from selfish workers ($\gamma = 0$) as both types of people likely answer "not at all like me" to the question on altruism. Nor can we be sure that we can distinguish workers with conflicting mission preferences ($\beta < 0$) from workers with a neutral stance towards the public sector's mission ($\beta = 0$), as we cannot rule out that both answer "none at all" to the question on confidence in political parties. Hence, the variation in our data mainly stems from workers who are at least to some extent altruistic and who have a relatively positive attitude towards the public sector's mission. Nevertheless, as we shall see, we find some indication for spite among highly educated workers in the lowest altruism category.

We restrict our analysis to respondents with a job (either full time, part time, or self employed) who work either in government and public institutions or in private business and industry. We omit all workers from private not-for-profit organizations, as it is not obvious how to classify them.[10] These restrictions result in a sample of 30,652 workers in 50 different countries,[11] of whom 9,002 (29.4%) work in the public sector. The number of observations per country ranges from 436 to 1,394. Our data contain between 60 and 460 workers in the public sector for each country.

[9] To our knowledge, a data set covering workers in both the public and private sector and containing both a measure of altruism and a better measure of mission alignment does not exist. In addition to the question on confidence in political parties, the World Values Survey also contains a question on confidence in parliament. Performing our empirical analysis using this measure instead of confidence in political parties gives similar but slightly weaker results.

[10] In some countries, not-for-profit organizations are highly subsidized and under control of the public sector. In others, not-for-profit organizations are much more autonomous and sometimes function as a substitute for public goods provision by the government.

[11] Countries included in the analysis are: Andorra, Argentina, Australia, Brazil, Bulgaria, Burkina Faso, Canada, Chile, China, Cyprus, Egypt, Ethiopia, Finland, France, Georgia, Germany, Ghana, India, Indonesia, Iran, Japan, Malaysia, Mali, Mexico, Moldava, Morocco, Netherlands, Norway, Peru, Poland, Romania, Russia, Rwanda, Slovenia, South Africa, South Korea, Serbia, Spain, Sweden, Switzerland, Taiwan, Thailand, Trinidad and Tobago, Turkey, Ukraine, United Kingdom, United States, Uruguay, Vietnam, and Zambia.

The sector of employment variable is recoded to a dichotomous variable scoring one when public sector and zero when private sector. We use binary logistic regression[12] to estimate the odds that an individual with given characteristics works in the public sector. We control for several demographics D, such as age, gender, and education level of a worker.[13] We include country fixed effects α_j to control for unobserved heterogeneity between countries. The specification of our regression equation is:

$$\ln\left(\frac{\Pr(public)}{\Pr(private)}\right) = \lambda A + \kappa C + \psi\left(A \times C\right) + D'\delta + \alpha_j + \varepsilon, \tag{2.1}$$

where A is our measure of altruism, C measures confidence in political parties, and ε is the error term. For ease of interpretation of the coefficients, A and C are both mean-centred. Our key parameter of interest is ψ, which should be positive when altruism and confidence in political parties are mutually reinforcing, as our theory suggests. We perform a test whether $\psi = 0$ against the one sided alternative that it is positive. Our theory provides little guidance regarding the signs of λ and κ. However, following prediction 1, the sum of λ and ψ should be positive for sufficiently high values of C. Likewise, following prediction 2, the sum of κ and ψ should be positive for sufficiently high values of A. We shall test these predictions by computing the marginal effects and the corresponding standard errors for all possible values of A and C.

Table 2.1 shows the descriptive statistics of the sample.[14] Both altruism and confidence in political parties are slightly but significantly higher among public sector workers as compared to private sector workers ($p < 0.01$). This can also be seen in Figures 2.2 and 2.3. Kolmogorov-Smirnov tests confirm that these distributions are

[12] We prefer binary logistic regression over probit regression because it simplifies the interpretation of results. Running the analysis with binary logistic regression gives a slightly better fit than probit (based on McFadden R^2).

[13] A referee noted that a worker's risk preferences can also be an important determinant of sorting to the public sector, since the public sector commonly offers relatively secure jobs. Not controlling for such risk preferences biases our results if altruism and risk preferences are correlated. While it is not possible to control for risk preferences with the current data set, we checked whether risk preferences and altruism are correlated in another data set, the German Socio-Economic Panel, and found a very small and insignificant correlation (see Table 3.2 in chapter 3).

[14] Compared to the original data, scales of altruism and confidence in political parties are reversed for interpretational purposes.

significantly different between public sector and private sector workers ($p < 0.01$). There are some substantial differences in demographics between public and private sector workers. Public sector workers are more likely female, higher educated, and slightly older as compared to private sector workers. In the empirical analysis we shall control for these differences in observables.

Table 2.1: Descriptive statistics

	Obs.	Public	Private	Total
Altruism	30652			
Mean		4.77	4.68	4.71
Standard deviation		(1.08)	(1.11)	(1.10)
Confidence in political parties	28429			
Mean		2.09	2.03	2.05
Standard deviation		(0.82)	(0.80)	(0.81)
Gender: % female	30463			
Mean		0.49	0.39	0.42
Standard deviation		(0.50)	(0.49)	(0.49)
Age: years	30463			
Mean		40.49	38.45	39.05
Standard deviation		(11.33)	(12.34)	(12.08)
Education: % level	30463			
None		0.01	0.07	0.05
Incomplete primary		0.02	0.05	0.04
Primary		0.05	0.12	0.10
Incomplete secondary		0.05	0.07	0.06
Secondary		0.22	0.22	0.22
Incomplete university preparatory		0.05	0.06	0.06
University preparatory		0.17	0.17	0.17
University: no degree		0.10	0.07	0.08
University		0.34	0.15	0.21
Countries	50			
Observations		9002	21650	30652

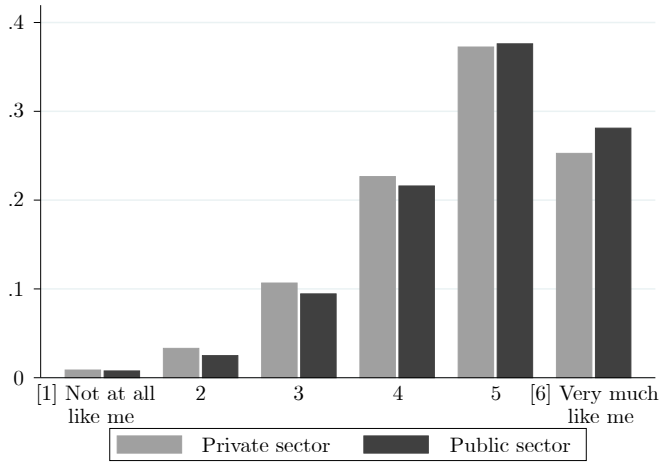

Figure 2.2: Density of altruism

Notes: Altruism is measured by the response to the statement "It is important to this person to help the people nearby; to care for their well-being". The answer categories are [1] Not at all like me, [2] Not like me, [3] A little like me, [4] Somewhat like me, [5] Like me, and [6] Very much like me.

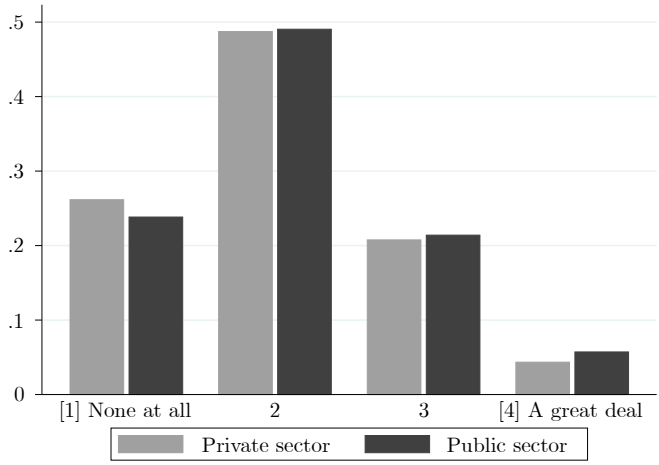

Figure 2.3: Density of confidence in political parties

Notes: Confidence in political parties is measured by the response to the question "Could you tell me how much confidence you have in [Political parties]?" The answer categories are [1] None at all, [2] Not very much, [3] Quite a lot, and [4] A great deal.

2.5 Results

Table 2.2 shows the results of the binary logistic regressions for the full sample of workers. We report both the regression estimates b and the average marginal effect on the probability *ame*. The average marginal effect on the probability gives the average of the marginal effects evaluated for all observations. Following most previous studies, our first estimation includes only altruism as explanatory variable. Clearly, workers with higher levels of altruism are more likely to be employed in the public sector. This effect is both economically and statistically significant. A marginal increase by one from the mean of the altruism variable results in a 1.6 percentage points higher probability of working in the public sector instead of the private sector.[15] This implies a substantial difference in the probability of working in the public sector instead of the private sector of 7.6 percentage points between the least altruistic people and the most altruistic people in our sample. This result is well in line with the earlier empirical studies discussed in section 2.2.

Next we control for demographic characteristics and country dummies. The effect of altruism is robust in sign and significance; the marginal effect of altruism decreases from 1.6 to 1.2 percentage points, but remains highly significant. The demographic control variables turn out to be important for sorting to the public sector. Consistent with earlier studies (e.g. Lewis and Frank 2002, Buurman et al. 2012), we find that the likelihood of being employed in the public sector is higher for females and increases with age and education. Wald tests show that the education level dummies differ significantly from each other. The country dummies, which control for unobserved differences across countries, are jointly highly significant ($p < 0.01$).

Column 3 of Table 2.2 includes confidence in political parties and the interaction with altruism as explanatory variables. The conditional marginal effect of altruism remains economically and statistically significant. The marginal effect of altruism is 1.1 percentage points, given average confidence in political parties (recall that altruism and confidence in political parties are mean-centred). The control variables remain significant with similar magnitudes and signs. The marginal effect

[15] We also tested for nonlinear effects of altruism, but these turn out to be insignificant and add little explanatory power.

Table 2.2: Results of the binary logistic regression (full sample)

Dependent variable: sector of employment	(1)		(2)		(3)	
	b	ame	b	ame	b	ame
Altruism	0.077***	0.016	0.068***	0.012	0.062***	0.011
	(0.012)		(0.013)		(0.014)	
Female			0.476***	0.086	0.457***	0.082
			(0.028)		(0.029)	
Age			0.100***	0.018	0.094***	0.017
			(0.007)		(0.007)	
Age^2			-0.001***	-0.000	-0.001***	-0.000
			(0.000)		(0.000)	
Education:						
-Incomplete primary			0.626***	0.042	0.752***	0.047
			(0.139)		(0.161)	
-Primary			1.092***	0.088	1.183***	0.089
			(0.120)		(0.141)	
-Incomplete secondary			1.526***	0.145	1.639***	0.148
			(0.125)		(0.144)	
-Secondary			2.033***	0.231	2.142***	0.232
			(0.115)		(0.136)	
-Incompl. university prep.			1.921***	0.210	1.957***	0.199
			(0.124)		(0.145)	
-University preparatory			2.167***	0.256	2.249***	0.252
			(0.115)		(0.137)	
-University: no degree			2.416***	0.307	2.517***	0.306
			(0.120)		(0.141)	
-University			2.946***	0.424	3.074***	0.429
			(0.115)		(0.136)	
Confidence					0.090***	0.016
					(0.019)	
Confidence × Altruism					0.024*	0.005
					(0.016)	
Intercept	-0.879***		-5.605***		-5.535***	
	(0.013)		(0.215)		(0.231)	
Country fixed effects	No		Yes		Yes	
Observations dep=0	21650		21537		20196	
Observations dep=1	9002		8926		8233	
Total observations	30652		30463		28429	
McFadden R^2	0.001		0.124		0.119	
Log likelihood	-18535		-16149		-15068	

Notes: Standard errors between parentheses. Variables altruism and confidence are centered around their sample mean. For factor variables the column ame shows the effect for a discrete change from the base level. *, **, and *** indicate significance at the .10, .05, and .01 levels, respectively.

of confidence in political parties conditional on average altruism is also significant and positive; an increase of confidence in political parties results in a 1.6 percentage points higher probability of working in the public sector instead of the private sector. We find evidence in support of our key prediction, the one-sided test for a positive interaction effect between altruism and confidence in political parties is significant ($p = 0.066$). A unit increase of confidence in political parties leads to an additional marginal effect of altruism of 0.5 percentage points.[16]

Table 2.3: Average marginal effects (full sample)

	Altruism			Confidence in political parties	
Confidence in political parties	Marg. eff.	Std. err.	Altruism	Marg. eff.	Std. err.
1	0.006*	(0.004)	1	0.000	(0.010)
2	0.011***	(0.002)	2	0.004	(0.008)
3	0.015***	(0.004)	3	0.008	(0.006)
4	0.020***	(0.006)	4	0.013***	(0.004)
			5	0.017***	(0.003)
			6	0.022***	(0.005)

Notes: Column ame shows the average marginal effect on the probability given the value of the other independent variable. Standard errors are calculated using the delta method. *, **, and *** indicate significance at the .10, .05, and .01 levels, respectively.

Table 2.3 shows in more detail how the marginal effect of altruism changes with confidence in political parties, and also how the marginal effect of confidence in political parties changes with altruism. Well in line with our predictions, the marginal effect of a worker's altruism is strongly increasing in the worker's confidence in political parties. Similarly, we find no significant marginal effect of confidence in political parties for low values of altruism and positive and significant effects for high values. In contrast to our predictions, we do not find negative marginal effects of altruism and confidence at the lower ends of the scales. As discussed in the previous section, this may be due to the fact that we cannot distinguish spiteful workers and workers with conflicting mission preferences from workers with a more positive stance.

[16]The marginal effect of the interaction term is calculated according to the method proposed in Ai and Norton (2003). We find a consistently positive interaction effect for all observations in our sample.

Figure 2.4 depicts for each possible combination of altruism and confidence in political parties, the predicted probability (and its 95% confidence interval in transparent planes) of working in the public sector as compared to people with average altruism and confidence in political parties (depicted by the light grey plane). Clearly, highly altruistic workers with strong confidence in political parties are more likely to work in the public sector, with a positive and significant difference in probability of up to 6.5 percentage points as compared to an average worker (note that the predicted probability of working in the public sector for an average worker is 25.5%). In contrast, a nonaltruistic worker with weak confidence shows a significantly lower likelihood of working in the public sector (total effect up to −4.1 percentage points lower probability). Altruistic workers with weak confidence and nonaltruistic workers with strong confidence are not significantly more or less likely to work in the public sector as compared to an average worker.

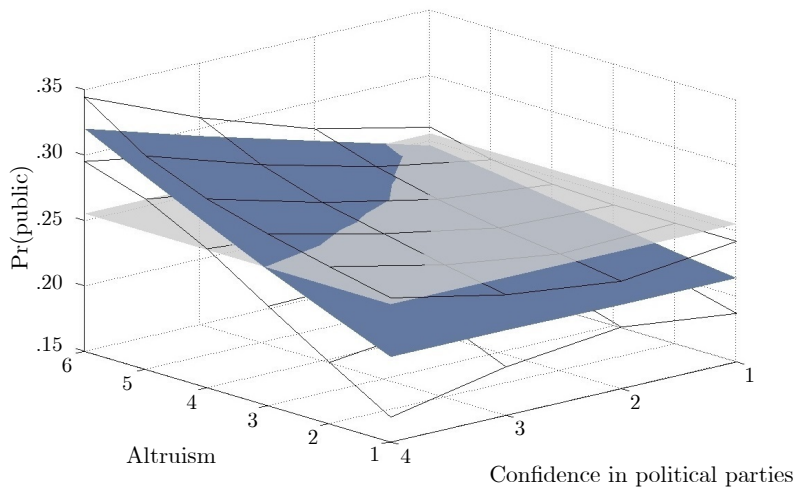

Figure 2.4: Predicted probabilities of working in the public sector for each combination of altruism and confidence in political parties (full sample)

Notes: Transparent planes show the 95% confidence interval, and the light grey plane shows the predicted probability of working in the public sector for a worker with average altruism and confidence in political parties.

Our data set includes both well-developed countries and less-developed countries. We examine heterogeneity between these two groups of countries by estimating equation (2.1) for two subsamples; well-developed countries (as measured by their OECD membership) and less-developed countries (without OECD membership). Table 2.4 shows that the differences in results between these two groups of countries are small but remarkable. The conditional marginal effect of a worker's altruism on the likelihood of working in the public sector is stronger in well-developed countries as compared to less-developed countries. The marginal effect of altruism, given average confidence in political parties, is 1.5 percentage points for workers in well-developed countries and 0.7 percentage points for workers in less-developed countries. Conversely, the conditional marginal effect of a worker's confidence in political parties is less important in well-developed countries as compared to less-developed countries. The marginal effect of an increase in confidence in political parties, given average altruism, is 1.1 percentage points for workers in well-developed countries and 1.8 percentage points for workers in less-developed countries. The interaction between altruism and confidence in political parties is also lower in well-developed countries as compared to less-developed countries. A unit increase in confidence results in an additional marginal effect of altruism of 0.3 percentage points for workers in well-developed countries and in an additional marginal effect of altruism of 0.5 percentage points for workers in less-developed countries.[17] These results are reasonably well in line with the results of our full sample estimations.

Summarizing, we find some remarkable differences between well-developed and less-developed countries in the effect of altruism, confidence, and the interaction between altruism and confidence on the likelihood of working in the public sector. One possible explanation for why altruism matters more for sorting in well-developed countries as compared to less-developed countries lies in the stronger need to get any job in less-developed countries, resulting in stronger competition for public sector jobs. We would expect to see a diluted effect of altruism in less-developed countries if selfish workers are more successful in acquiring a job under such strong competition than altruistic workers, as in, e.g., Lazear (1989). We also find that a worker's

[17] As in the full sample, the interaction effect calculated according to the method of Ai and Norton (2003) is consistently positive for all observations in both subsamples.

Table 2.4: Results of regression for OECD and nonOECD member countries

Dependent variable: sector of employment				
Countries:	OECD		NonOECD	
	b	ame	b	ame
Altruism	0.080***	0.015	0.042**	0.007
	(0.023)		(0.018)	
Female	0.719***	0.134	0.274***	0.048
	(0.046)		(0.038)	
Age	0.096***	0.017	0.091***	0.016
	(0.012)		(0.009)	
Age^2	-0.001***	-0.000	-0.001***	-0.000
	(0.000)		(0.000)	
Education:				
-Incomplete primary	0.193	0.025	0.683***	0.041
	(0.495)		(0.173)	
-Primary	0.070	0.009	1.139***	0.082
	(0.457)		(0.152)	
-Incomplete secondary	0.292	0.038	1.727***	0.158
	(0.459)		(0.157)	
-Secondary	0.522	0.073	2.380***	0.273
	(0.452)		(0.143)	
-Incompl. university prep.	0.662	0.097	1.978***	0.199
	(0.458)		(0.160)	
-University preparatory	0.870*	0.134	2.346***	0.266
	(0.452)		(0.145)	
-University: no degree	0.994**	0.158	2.743***	0.349
	(0.453)		(0.154)	
-University	1.595***	0.286	3.257***	0.464
	(0.450)		(0.145)	
Confidence	0.057*	0.011	0.106***	0.018
	(0.035)		(0.023)	
Confidence × Altruism	0.014	0.003	0.028*	0.005
	(0.031)		(0.019)	
Intercept	-4.268***		-5.986***	
	(0.530)		(0.248)	
Country fixed effects	Yes		Yes	
Observations dep=0	7813		12383	
Observations dep=1	3088		5145	
Total observations	10901		17528	
McFadden R^2	0.091		0.143	
Log likelihood	-5909		-9088	

Notes: Standard errors between parentheses. Variables altruism and confidence are centered around their sample mean. For factor variables the column ame shows the effect for a discrete change from the base level. *, **, and *** indicate significance at the .10, .05, and .01 levels, respectively.

confidence and the mutually reinforcing relation between a worker's altruism and confidence are somewhat less important for sorting in well-developed countries as compared to less-developed countries. A possible explanation for these results is that there is more variation in quality of the public sector within the group of less-developed countries making it easier to identify an effect of confidence. Alternatively, public sector jobs may be less secure in less-developed countries, depending on which parties are ruling the country.

Previous research has shown that public service motivation is a more important determinant of sector of employment for higher educated workers (Lewis and Frank 2002). To assess differences between education levels in our sample, we estimate equation (2.1) for three subsamples: a low, intermediate, and high level of education subsample.[18] Table 2.5 reports the estimation results for these subsamples. Well in line with Lewis and Frank (2002), we find relatively weak effects for workers with low and intermediate education, while for highly educated workers we find very strong effects on sector of employment of altruism, confidence in political parties, and, in particular, for the interaction between these two. The coefficient for the interaction term is more than three times as large as compared to the regression using the full sample and highly significant ($p < 0.01$).[19] Our hypothesis that altruism and mission alignment are mutually reinforcing thus finds strong support among the highly educated workers. Table 2.6 reports the corresponding marginal effects for the subsample of highly educated workers. In line with our predictions, we find no significant marginal effect of altruism for low values of confidence in political parties, while the marginal effect is positive and highly significant for high values of confidence. Likewise, we find a positive and significant marginal effect of confidence in political parties on public sector employment for highly altruistic workers. For

[18] The low subsample includes all workers who have less than secondary education (categories 1 to 4 in the data set), the intermediate subsample includes all workers with at least secondary education and at most university prepatory education (categories 5 to 7), and the high subsample includes all workers with more than university prepatory education (category 8 and 9).

[19] The interaction effect is computed according to the method described in Ai and Norton (2003) and shows a consistently positive and significant interaction across all observations in the subsample of highly educated workers. In the subsamples of workers with low and intermediate levels of education, we find the interaction effect to be consistently insignificant over all observations, without a clear prediction on the sign of the interaction in the intermediate subsample.

Table 2.5: Results of regression with sample split on educational level

Dependent variable: sector of employment						
Group:	Low		Intermediate		High	
	b	ame	b	ame	b	ame
Altruism	0.056	0.006	0.047**	0.009	0.078***	0.017
	(0.035)		(0.020)		(0.024)	
Female	0.200***	0.022	0.364***	0.067	0.693***	0.153
	(0.076)		(0.043)		(0.049)	
Age	0.058***	0.006	0.087***	0.016	0.129***	0.028
	(0.017)		(0.011)		(0.014)	
Age^2	-0.000**	-0.000	-0.001***	-0.000	-0.001***	-0.000
	(0.000)		(0.000)		(0.000)	
Education:						
-Incomplete primary	0.391**	0.033				
	(0.173)					
-Primary	0.576***	0.051				
	(0.158)					
-Incomplete secondary	0.982***	0.100				
	(0.166)					
-Secondary						
-Incompl. university prep.			-0.213***	-0.036		
			(0.076)			
-University preparatory			0.140***	0.026		
			(0.050)			
-University: no degree						
-University					0.585***	0.126
					(0.058)	
Confidence	0.079*	0.009	0.104***	0.019	0.112***	0.025
	(0.047)		(0.028)		(0.034)	
Confidence × Altruism	-0.012	-0.001	-0.002	0.000	0.081***	0.018
	(0.037)		(0.023)		(0.029)	
Intercept	-3.823***		-3.438***		-3.894***	
	(0.431)		(0.328)		(0.327)	
Country fixed effects	Yes		Yes		Yes	
Observations dep=0	6115		9357		4724	
Observations dep=1	1004		3598		3631	
Total observations	7119		12955		8355	
McFadden R^2	0.126		0.083		0.087	
Log likelihood	-2531		-7020		-5220	

Notes: Standard errors between parentheses. Variables altruism and confidence are centered around their subsample mean. For factor variables the column ame shows the effect for a discrete change from the base level. *, **, and *** indicate significance at the .10, .05, and .01 levels, respectively.

the middle altruism categories, we find no significant marginal effect of confidence. Lastly, for the lowest altruism category, we find a sizeable but insignificant negative marginal effect ($p = 0.103$). This is fully consistent with our model if many of the people in the lowest altruism category are spiteful.

Table 2.6: Average marginal effects (high education subsample)

	Altruism			Confidence in political parties	
Confidence in political parties	Marg. eff.	Std. err.	Altruism	Marg. eff.	Std. err.
1	-0.001	(0.008)	1	-0.039	(0.024)
2	0.017***	(0.005)	2	-0.022	(0.019)
3	0.035***	(0.008)	3	-0.005	(0.013)
4	0.052***	(0.013)	4	0.012	(0.009)
			5	0.030***	(0.007)
			6	0.048***	(0.011)

Notes: Column ame shows the average marginal effect on the probability given the value of the other independent variable. Standard errors are calculated using the delta method. *, **, and *** indicate significance at the .10, .05, and .01 levels, respectively.

Figure 2.5 plots the predicted probabilities to work in the public sector for the subsample of highly educated workers. Highly educated workers with high altruism and strong confidence in political parties are up to 13.2 percentage points more likely to work in the public sector as compared to the average highly educated worker, who faces a predicted probability of 42.5%. Highly altruistic workers with weak confidence and nonaltruistic workers with strong confidence show a significant lower likelihood of working in the public sector. All three findings are consistent with our model, with the latter two indicative of conflict of mission preferences and spite among the highly educated workforce, respectively.

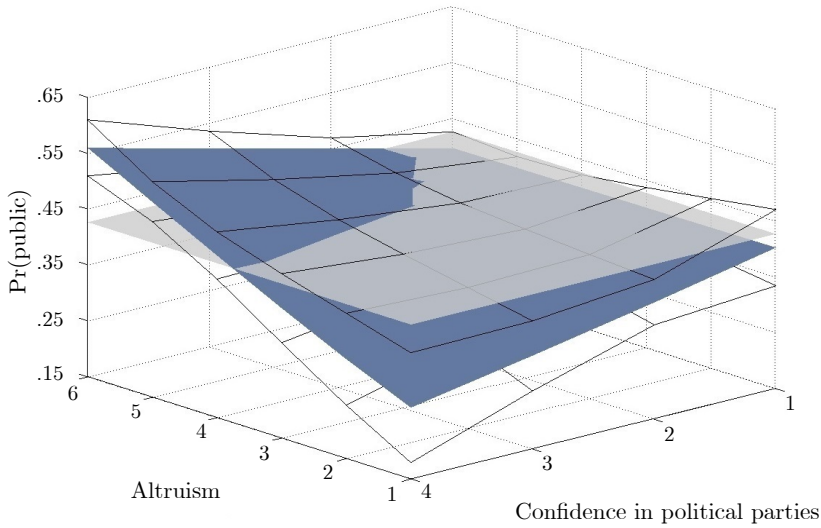

Figure 2.5: Predicted probabilities of working in the public sector for each combination of altruism and confidence in political parties (high education sample)

Notes: Transparent planes show the 95% confidence interval, and the light grey plane shows the predicted probability of working in the public sector for a worker with average altruism and confidence in political parties.

2.6 Conclusion

We have studied how a worker's altruism and mission preferences jointly affect his likelihood of working in the public sector rather than taking a job in the private sector. We built a very simple model that predicts that a worker's altruism and the alignment of his mission preferences with the mission of the public sector are mutually reinforcing forces. Simply put, our theory predicts that alignment of mission preferences matters more when a worker's altruism is higher and that altruism matters more when mission preferences are more closely aligned. We have tested these predictions using data from the World Values Survey, containing data on over 30,000 workers, covering their sector of employment, their willingness to help other people (altruism), and their confidence in political parties (which we take as a proxy for alignment with the public sector's mission). We find strong evidence for a mutually

reinforcing role of altruism and mission alignment in sorting to the public sector, particularly among highly educated workers and among workers in less-developed countries. Our results show that only those workers who are highly altruistic as well as have strong confidence in political parties have a significantly higher likelihood of working in the public sector, while workers with low altruism and weak confidence are significantly less likely to work in the public sector. The size of these effects is substantial. Highly altruistic workers with weak confidence and nonaltruistic workers with strong confidence are neither more nor less likely to sort to the public sector in the full sample. Among highly educated workers, the latter two groups have a significantly lower likelihood of working in the public sector. These results indicate that conflict of mission preferences and spite discourages some highly educated workers to sort into the public sector.

A caveat of our analysis (that we share with most previous studies) is that we cannot distinguish whether our results originate from (self-)selection of workers or from preference adaptation (see Wright and Grant 2010 for an interesting discussion of this issue). For instance, we cannot rule out that the patterns that we find in our data are nonexistent for workers who just started their career and so entirely arise from adaptation of preferences since workers have started a job in a particular sector. Following this interpretation of our results, employees acquire higher confidence in political parties and become more altruistic when working in the public sector. While this interpretation may have some intuitive appeal, the available empirical evidence points in the opposite direction for public sector workers' altruism. That is, when tenure increases, workers in the public sector tend to experience a decrease rather than an increase in altruistic motivations (see Blau 1960, Van Maanen 1975, Moynihan and Pandey 2007, De Cooman et al. 2009, and Buurman et al. 2012). Future research should provide insight into whether the same holds for confidence in political parties.

An interesting refinement of our study would be to examine how sorting relates to other, psychometrically sound measures of altruism and mission alignment, taking into account the complex nature of these concepts. In future research it would also be interesting to look closer at the differences in sorting patterns across countries.

For instance, differences between countries in the size of the public sector may lead to different sorting patterns when motivated workers are a scarce resource, as in Jones (2012). However, the size of the public sector might also be endogenous to the supply of motivated workers in a country. Differences between countries in the supply of motivated workers may stem from cultural differences. An interesting new direction for research would be to examine how such cultural differences affect the supply and sorting of motivated workers.

Much remains to be done to better understand sorting of workers to the public sector. We believe that this endeavor calls for a multidisciplinary approach where public administration scholars, psychologists, political scientists, and economists join forces and benefit from each others' strengths. Economics (which is our discipline) has much to offer to the analysis of institutional design. Issues such as organizational ownership (for-profit, not-for-profit, public), wage compensation, and incentive structures have been a focus in economic research for many decades. It is only recently that such analyses have been extended to allow for nonselfish preferences and other complexities (see the studies discussed in the second paragraph of section 2.2 and the recent survey by Kőszegi 2013). We expect major progress in this area in the next years, resulting in new testable hypotheses, with some of these speaking to the issue of sorting to the public sector. On the empirical side, economists have made quite some progress in designing incentivized experiments so as to learn about people's preferences (see the references in footnote 3 and the review by Andreoni et al. 2008). Such measures of revealed preferences may function as a useful complement to measures of stated preferences commonly used in public administration.

Chapter 3

Intrinsic Motivations of Public Sector Employees: Evidence for Germany

Joint with Robert Dur[1]

3.1 Introduction

Public sector organizations often strive for multiple goals, most of them being difficult to describe in an objective and precise way (Dixit 2002). The multitude and vagueness of public sector organization's goals are also reflected in the way performance of employees is assessed in the public sector. As compared to employees in the private sector, performance assessment in the public sector is relatively rare and, if it exists, often tied to weaker incentives (Burgess and Metcalfe 1999). As a result, performance of employees in the public sector relies much more on intrinsic motivations than on extrinsic incentives. A key issue therefore is what types of intrinsic motivations are prevalent among public sector employees.

A rich empirical literature in public administration and a recent theoretical literature in economics have addressed this issue. A key finding from the public administration literature is that more altruistic people are more likely to end up in a

[1] A slightly adapted version of this chapter is forthcoming in *German Economic Review*.

public-sector job.[2] The economics literature has studied the interplay between employee compensation packages and self-selection of people with different motivations to the public sector.[3] A common finding is that the public sector can promote self-selection of motivated or altruistic employees by offering low pay (Handy and Katz 1998, Delfgaauw and Dur 2007). Further, several studies have shown that, even if performance assessment in the public sector is perfectly feasible, it can be optimal to provide weak incentives to employees in the public sector so as to extract rents (Besley and Ghatak 2005, Delfgaauw and Dur 2007, Francois 2007). Providing weak incentives may, however, also imply that the public sector becomes an attractive employer for lazy people (Delfgaauw and Dur 2008).

This chapter examines differences in altruism and laziness between employees in the public sector and the private sector. We start our analysis by developing a simple model of sorting to the public sector in an economy where workers differ in altruism and laziness. In line with the evidence cited above, we assume that in a public sector job, extrinsic rewards for performance are relatively low (because performance is more difficult to measure) while intrinsic rewards for performance are relatively high (because of the opportunity to contribute to other people's welfare in a public sector job). Our theoretical analysis predicts that a worker's likelihood of working in the public sector increases with his altruism, and increases or decreases with his laziness depending on his altruism. Altruism induces sorting to the public sector because public sector jobs offer an opportunity to contribute to other people's welfare. Laziness has a more indirect effect on sorting. As lazy people find it costly to work hard, their choice of sector is not so much driven by sectoral differences in rewards for performance, but more by sectoral differences in other benefits and costs that are unrelated to effort. Hence, for selfish workers, the likelihood of working in the public sector increases with laziness, because more lazy workers more likely forego the high extrinsic rewards for performance in the private sector to enjoy

[2]See among others Rainey (1982), Crewson (1997), Houston (2000 and 2006), Brewer (2003), Lewis and Frank (2002), and Frank and Lewis (2004). Perry et al. (2010) provide an overview of this literature.

[3]See among others Handy and Katz (1998), Francois (2000 and 2007), Besley and Ghatak (2005), Prendergast (2007), Delfgaauw and Dur (2007 and 2008), Nyborg and Brekke (2010), and Buurman and Dur (2012). Francois and Vlassopoulos (2008) provide an overview of this literature.

public sector benefits that are unrelated to effort (among others the base salary). The opposite holds for highly altruistic workers who find effort more rewarding in the public sector than in the private sector. When such highly altruistic workers are more lazy, they more likely forego the high intrinsic rewards for performance in the public sector in return for private sector benefits unrelated to effort. Hence, our theory predicts a negative interaction effect between a worker's altruism and laziness. Depending on the exact parameter values, either workers who are altruistic and energetic or workers who are altruistic and lazy are most likely to sort to a public-sector job. Workers who are selfish and energetic are always least likely to sort to the public sector.

We test our theoretical predictions using data from the German Socio-Economic Panel Study (SOEP). The SOEP is a yearly panel that started in 1984 and now covers over 11,000 German households (see Wagner et al. 2007). The rich set of personality measures and demographic variables in the SOEP offers a rare opportunity to study sorting of altruistic and lazy workers to the public sector. Following Becker et al. (2012), our measure for altruism is the worker's response to the survey question: How important is it for you to "be there for others"? This question was included in the 2004-wave. Our measure for laziness comes from the 2005-wave and is given by the worker's response to the statement: "I see myself as someone who tends to be lazy." We examine how these self-reported personality characteristics are related to sector of employment after controlling for a rich set of demographics.[4]

The results of our empirical analysis are as follows. In line with our predictions, we find that the likelihood of working in the public sector is positively and significantly related to a worker's altruism. A one standard-deviation increase in altruism results in a 1.3 percentage points higher probability of working in the public sector. We find a similar result for a worker's laziness, both in size and statistical significance. A one standard-deviation increase in laziness results in a 1.4 percentage

[4]One may wonder whether respondents always truthfully report such personality characteristics and, in particular, whether truth-telling might be correlated with sector of employment. While our data do not allow us to correct for such possible biases, a recent incentivized experiment by Abeler et al. (2014) finds among a representative sample of the German population that participants forego considerable amounts of money to avoid lying. Moreover, lying appears to be uncorrelated with sector of employment (personal communication with Johannes Abeler).

points higher probability of working in the public sector. In contrast to our predictions, we find no evidence for an interaction effect between a worker's altruism and laziness. The estimate of the interaction effect is insignificant and very close to zero. Our estimates imply that workers who are both altruistic and lazy have the highest likelihood of ending up in the public sector. The predicted probability of a highly altruistic and highly lazy worker of working in the public sector is 33%. Workers who are selfish and highly energetic are least likely work in the public sector, with a predicted probability of 20%.

Next, we do a series of robustness checks. First, we check whether the results are similar across education levels. In line with previous work for other countries (Lewis and Frank 2002, Dur and Zoutenbier 2014), we find stronger effects of altruism (and also of laziness) for better educated workers, with point estimates that are twice as large as those for the full sample. Next, following Gregg et al. (2011), we examine in how far our results are driven by the overrepresentation of 'caring' jobs in the public sector. Restricting the sample to employees in caring industries, we find that altruism becomes twice as important for sorting to the public sector, while we find no change in the importance of laziness (though the effect is no longer statistically significant). For employees in noncaring industries, we find positive and significant sorting of lazy people to the public sector, but no sorting of altruistic people. These results nicely complement those of Gregg et al. (2011) for the UK, who exploit panel data on self-reported unpaid overtime of employees in for-profit and not-for-profit caring and noncaring industries.

Lastly, we examine whether the sorting patterns that we find are mainly the result of self-selection at the beginning of people's career, or whether the sorting patterns become more pronounced for more experienced employees. Work experience may affect sorting patterns for two reasons. First, initial years of people's careers may be spent on 'job shopping,' with many people holding jobs that are not a good match with their tastes and abilities (as in the models by Johnson 1978, Jovanovic 1979, and Neal 1999). As a result, we would expect weaker sorting patterns for employees with shorter work experience. Second, employees' preferences may adapt to experience, for instance as a result of organizational socialization (Brewer 2008). Such

preference adaptation may result in stronger or weaker sorting patterns depending on how entrants' attitudes differ from the prevailing organizational culture. Previous empirical work has found a decline in altruistic motivations with tenure among public sector employees (Blau 1960, Van Maanen 1975, Moynihan and Pandey 2007, De Cooman et al. 2009, and Buurman et al. 2012). We do not find a similar pattern in our data. Public sector employees are more altruistic as compared to their private sector counterparts at the start of their career, and by and large it remains like this throughout their career. However, we do find a striking pattern for laziness, with small differences between the public and private sector early in people's career, and big differences later on. To what extent these differences are driven by early-career job shopping or preference adaptation is, unfortunately, hard to uncover due to the cross-sectional nature of our data.

The SOEP data have been used previously to examine sorting of workers to the public sector. Pfeifer (2011) focuses on risk attitude and finds clear evidence that people who are more risk averse are more likely to sort to the public sector. We include risk attitude as a control variable in our regressions and find a similar result. In addition to risk attitude, Dohmen and Falk (2010) take up a number of broad measures of people's preferences and personality, such as (positive and negative) reciprocity, trust, and all of the 'Big Five' personality indicators. Likewise, Luechinger et al. (2010) include the self-assessed importance of 'having a successful career' and 'being engaged in social and political activities'. In contrast to these studies, our empirical analysis is – inspired by our theory – confined to the role of more narrowly defined facets of personality, namely altruism and laziness. While the use of broad personality measures such as Big Five is quite common (see, e.g., the reviews by Almlund et al. 2011 and Becker et al. 2012), these measures have been criticized for being too blunt and for suppressing important underlying facets of personality (Borghans et al. 2008: 1008-1009). Indeed, several studies in psychology find that underlying trait measures do a better job in predicting and explaining behavior and outcomes than the Big Five indicators (e.g. Paunonen and Ashton 2001 and Roberts et al. 2005). In line with these findings, we find pretty strong sorting to the public sector on the basis of the narrowly defined traits of altruism and

laziness, whereas Dohmen and Falk (2010) and Luechinger et al. (2010) find much weaker and often insignificant patterns using broader measures of social preferences and conscientiousness.

While the main aim of our study is to contribute to the body of knowledge about the nature and origin of public sector workers' motivations, we believe that our findings may also help policy makers to design better HR policies. By learning about employees' intrinsic motivations, HR specialists are better able to fine-tune personnel policies in the public sector to the special needs and wishes of the current workforce. Moreover, in the light of our findings, policy makers may wish to reconsider current personnel policies so as to attract and retain a differently motivated workforce in the future.

The remainder of the chapter is organized as follows. In the next section, we develop and analyze a simple model of sorting and derive our key hypotheses. Section 3.3 describes the data and our empirical strategy. The results of the empirical analysis are presented in section 3.4. Lastly, Section 3.5 concludes.

3.2 Theory

Building on Delfgaauw and Dur (2008), we develop a simple model of sorting to the public sector. Workers in our model are heterogenous in two ways: they differ in altruism, denoted by $\gamma_i \in [0, \overline{\gamma}] \geq 0$, and in laziness, denoted by $\theta_i \in [\underline{\theta}, \overline{\theta}] > 0$. Both characteristics are private information of the individual and are drawn from a continuous distribution.[5] As in Besley and Ghatak (2005) and Delfgaauw and Dur (2008), altruism in our model is of the impure form. That is, altruistic individuals care about their personal contribution to other people's welfare, not about other people's welfare per se (see Andreoni 1990). Tonin and Vlassopoulos (2010) provide field-experimental evidence supporting this assumption.

Workers choose their sector of employment, either the private sector or the public sector. The private sector is perfectly competitive such that workers are paid the full marginal product, denoted by p, for each unit of effort. For convenience, we

[5] This contrasts Delfgaauw and Dur (2008), who consider a three-type model (featuring motivated, regular, and lazy workers).

abstract from opportunities to contribute to other people's welfare in the private sector, and so a worker's altruism γ does not affect his utility when working in the private sector.[6] A worker's laziness θ enters the worker's utility function through the cost of effort, which is identical across sectors. The utility from working in the private sector is given by:

$$U^{private} = pe_i - \frac{\theta_i e_i^2}{2},$$

implying that optimal effort equals:

$$e_i^{private} = \frac{p}{\theta_i}.$$

By substituting optimal effort into the utility function, we obtain the indirect utility from working in the private sector for a worker of type (γ_i, θ_i): $\frac{p^2}{2\theta_i}$. Thus, a worker's indirect utility from working in the private sector increases in the marginal product of effort and decreases in a worker's laziness.

In contrast to the private sector, a worker's effort in the public sector is unobservable. Hence, workers cannot be paid for performance and, instead, receive a base salary denoted by w.[7] In addition, altruistic workers enjoy a nonpecuniary benefit equal to $\gamma_i e_i$ from making a contribution to public sector output. Thus, worker's utility from working in the public sector is given by:

$$U^{public} = w + \gamma_i e_i - \frac{\theta_i e_i^2}{2} - \varepsilon_i,$$

implying an optimal level of effort equal to:

$$e_i^{public} = \frac{\gamma_i}{\theta_i}.$$

The stochastic term ε_i captures an individual-specific difference in utility when em-

[6] Allowing for such opportunities (e.g. making charitable donations, volunteering) would not change our results as long as such contributions are not a perfect substitute for work effort in the public sector. For instance, a public sector job may simply make it more easy or less costly to contribute to other people's welfare. Huck and Rasul (2010) provide convincing evidence for substantial transaction costs in making charitable donations.

[7] Complete absence of performance-related pay is, of course, an extreme assumption and made for convenience only. All of our results hold as long as incentive pay is weaker in the public sector than in the private sector.

ployed in the public sector rather than in the private sector. It is drawn from a distribution with CDF $F(\varepsilon) = \Pr(\varepsilon_i \leq \varepsilon)$, PDF $f(\varepsilon) > 0$, and boundaries $\varepsilon \in [\underline{\varepsilon}, \overline{\varepsilon}]$ such that there is some variation in sector choice for each possible worker type (γ, θ). We do not restrict ε to be positive. That is, ε could just as easily be added to the private sector utility.[8] Substituting optimal effort into the utility function gives the indirect utility of working in the public sector for a worker of type (γ_i, θ_i): $w + \frac{\gamma_i^2}{2\theta_i} - \varepsilon_i$. Hence, a worker's indirect utility from working in the public sector is increasing in his altruism and decreasing in his laziness.

A worker joins the public sector when the utility from working in the public sector is higher than or equal to the utility from working in the private sector:

$$w + \frac{\gamma_i^2}{2\theta_i} - \varepsilon_i \geq \frac{p^2}{2\theta_i}.$$

Hence, the fraction of workers of type (γ_i, θ_i) who choose to work in the public sector is given by:

$$\Pr(\varepsilon_i \leq w + \frac{\gamma_i^2 - p^2}{2\theta_i}) = F(w + \frac{\gamma_i^2 - p^2}{2\theta_i}).$$

It immediately follows that the likelihood of choosing a job in the public sector increases in altruism γ_i:

$$\frac{\partial F(\cdot)}{\partial \gamma_i} = \frac{\gamma_i}{\theta_i} f(w + \frac{\gamma_i^2 - p^2}{2\theta_i}) > 0.$$

The intuition is straightforward: Higher altruism implies that a job in the public sector becomes intrinsically more rewarding and, hence, more attractive. The effect of a worker's laziness θ_i on the likelihood of choosing a public sector job is described by:

$$\frac{\partial F(\cdot)}{\partial \theta_i} = \frac{p^2 - \gamma_i^2}{2\theta_i^2} f(w + \frac{\gamma_i^2 - p^2}{2\theta_i}).$$

Hence, for relatively selfish workers (those with $\gamma_i < p$), the likelihood of public sector employment increases with laziness, while the reverse holds for highly altruistic workers (those with $\gamma_i > p$). The intuition is as follows. Workers choose sector

[8] As will become clear, our predictions on altruism and laziness are independent of ε. The ε term only has a level effect on the likelihood of public sector employment.

by comparing extrinsic and intrinsic rewards for performance (p and γ_i) and other individual-specific sector benefits that are unrelated to effort or performance (the stochastic term ε_i and the base salary). The latter benefits are more important for sector choice of more lazy workers. The reason is that lazy people find it costly to work hard and so they gain less utility when effort becomes more rewarding (intrinsically or extrinsically). Consequently, a selfish worker's likelihood of working in the public sector increases in his laziness, because a more lazy worker more likely foregoes the extrinsic rewards for performance in the private sector to enjoy the public sector's benefits that are unrelated to effort. The opposite holds for a highly altruistic worker. His likelihood of choosing the public sector decreases with his laziness, as a more lazy worker more likely chooses to forego the high intrinsic rewards for performance in the public sector to enjoy the private sector's benefits that are unrelated to effort (represented by ε_i).

Combined these comparative statics imply that workers who are selfish and energetic are least likely to sort to the public sector. If the type space is sufficiently rich (more precisely, if $\overline{\gamma} > p$), then workers who are altruistic and energetic are most likely to work in the public sector, followed by workers who are altruistic and lazy. This is illustrated in Figure 3.1.[9] If the type space is smaller such that $\overline{\gamma} < p$, then the effect of laziness on the likelihood of public sector employment is positive for all possible values of altruism. Hence, in that case, workers who are altruistic and lazy are most likely to sort to the public sector, see Figure 3.2.

[9] In creating Figure 3.1 (and Figure 3.2) the stochastic term ε is assumed to follow a continuous uniform distribution on the interval $[\underline{\varepsilon}, \overline{\varepsilon}]$. The figures look similar with other distributions as long as second-order effects through $f'(\cdot)$ are not dominant.

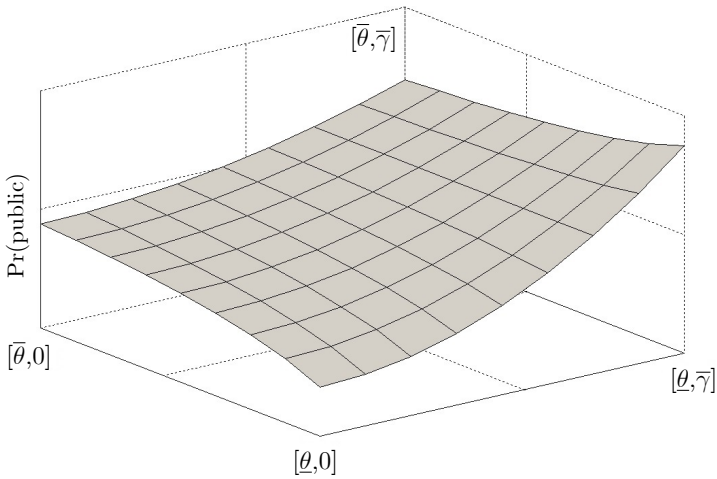

Figure 3.1: Predicted probabilities of working in the public sector (if $\overline{\gamma} > \text{p}$)

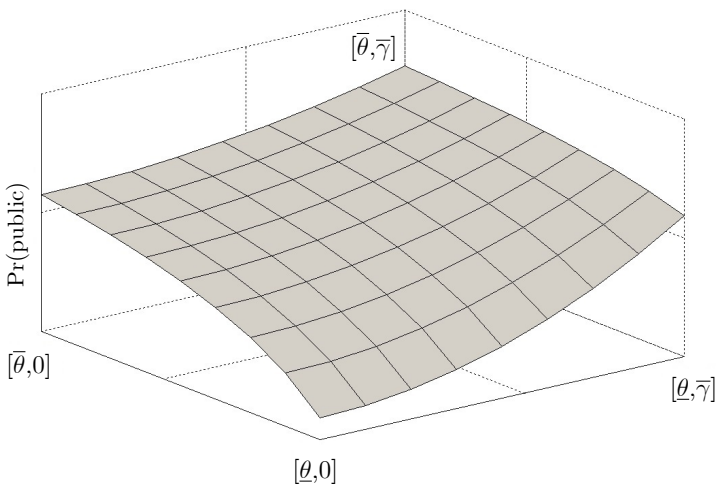

Figure 3.2: Predicted probabilities of working in the public sector (if $\overline{\gamma} < \text{p}$)

3.3 Data and empirical strategy

We test our predictions using data from the German Socio-Economic Panel study (SOEP), conducted by the German Institute for Economic Research (DIW Berlin). The SOEP is an unbalanced panel, containing yearly survey data. The first wave was conducted in 1984. The survey includes questions on employment, earnings, health, and – in recent waves – a rich set of personality measures. The SOEP covers over 11,000 German households and 20,000 people living in these households.[10]

Our key variables of interest are questions on stated altruism, laziness, and sector of employment. We measure altruism by the response to the question: "[How important] are the following things (Be there for others) currently for you?" Respondents rated themselves on a four-point scale, ranging from "not at all important" to "very important".[11] Laziness is measured by the response to the statement: "I see myself as someone who tends to be lazy". The response is measured on a seven-point scale ranging from "does not apply to me at all" to "applies to me perfectly".[12] Lastly, respondents indicated whether they are employed in the public sector by the question: "Does the company in which you are employed belong to the public sector?" A limitation of the data set is that we cannot infer whether a worker who does not work in the public sector is employed in a for-profit or not-for-profit organization. If not-for-profit organizations offer similar types of jobs as the public sector, our coefficients of interest are biased towards zero.

We restrict our analysis to respondents from the 2005 wave, because previous waves do not contain questions on a worker's laziness. The data on a worker's altruism are taken from the 2004 wave, because the question on altruism was not included in 2005. From the 2005 wave we select all workers (including self-employed workers) who answered the question on altruism in 2004 and who indicate that they are working in either the public sector or the private sector, resulting in a sample of 10,819 workers of whom 2,824 (26.1%) are employed in the public sector and 7,995

[10] Detailed information about the SOEP can be found at www.diw.de/gsoep/.

[11] The same measure for altruism is used in Becker et al. (2012), who study the relation between economic preferences and personality measures from psychology.

[12] Our measure for laziness is an underlying facet of one of the 'Big Five' personality measures. In section 3.1, we briefly discuss the pros and cons of using underlying facets.

(73.9%) are employed in the private sector.

We use a Linear Probability Model to estimate the probability that a worker with given altruism and laziness is employed in the public sector instead of the private sector.[13] We control for a number of demographics such as gender, age, education, nationality, marital status, number of children, and state of residence.[14] Additionally, we control for worker's risk preferences, as in Dohmen and Falk (2010), Luechinger et al. (2010), and Pfeifer (2011). The measure for risk preferences is taken from the 2004 wave and indicates a person's general aversion to risk as measured on an eleven-point scale by the response to the question "How do you see yourself: Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks?". Dohmen et al. (2011) have validated this measure through incentivized experiments.

Our regression specification is:

$$\Pr\left(Sector = public\right) = \alpha + \upsilon A + \omega L + \varphi(A \times L) + x'\delta + \varepsilon,$$

where A represents our measure of altruism, L is our measure of laziness, and the vector x contains all control variables. In line with our theoretical model we expect a positive effect of laziness ($\omega + \varphi \times A > 0$) for low values of altruism and a negative effect of laziness ($\omega + \varphi \times A < 0$) for high values of altruism. This implies that the conditional effect of laziness should be positive, $\omega > 0$, and the interaction effect of altruism and laziness should be negative, $\varphi < 0$. Next, we expect a positive effect of altruism for all values of laziness ($\upsilon + \varphi \times L > 0$); that is, we expect $\upsilon > 0$ to be sufficiently large as compared to $\varphi < 0$.

Table 3.1 shows the descriptive statistics of the sample. Public sector workers score themselves slightly higher as compared to private sector workers on altruism, laziness, and risk aversion. There are considerable differences between public sector workers and private sector workers in socio-demographic variables. Public sector

[13] We use the Linear Probability Model for ease of interpretation. Our results are robust to different model specifications: Probit or Logit give similar results. Fewer than 1% of all predicted outcomes using the Linear Probability Model fall outside the [0,1] interval.

[14] States included in the analysis are Bavaria, Baden-Wuerttemberg, Berlin (East), Berlin (West), Brandenburg, Bremen, Hamburg, Hessen, Lower Saxony, Mecklenburg-Vorpommern, North-Rhine-Westfalia, Rheinland-Pfalz, Saarland, Saxony, Saxony-Anhalt, Schleswig-Holtstein, and Thuringa.

workers are on average more likely to be female, older, higher educated, a German citizen, married, and have less children as compared to private sector workers. Table 3.2 shows correlations between the independent variables. Laziness shows a small but significant negative correlation with both altruism and risk aversion. The correlation between altruism and risk aversion is insignificant. Further, the table shows that our personality characteristics correlate with gender and age, suggesting that it is important to control for these demographics in the regression.

Table 3.1: Descriptive statistics

	Obs.	Public	Private	Total
Altruism	10819			
Mean		3.21	3.16	3.18
Standard deviation		(0.56)	(0.57)	(0.56)
Laziness	10819			
Mean		2.24	2.19	2.20
Standard deviation		(1.48)	(1.47)	(1.48)
Risk aversion	10574			
Mean		5.33	5.13	5.18
Standard deviation		(2.13)	(2.25)	(2.22)
Gender: % female	10574			
Mean		0.57	0.43	0.47
Standard deviation		(0.50)	(0.50)	(0.50)
Age	10574			
Mean		44.47	42.05	42.68
Standard deviation		(10.80)	(11.51)	(11.38)
Education: % level	10574			
Less than high school		0.07	0.12	0.11
High school		0.47	0.67	0.61
More than high school		0.46	0.21	0.28
Nationality: % German	10574			
Mean		0.97	0.92	0.93
Standard deviation		(0.18)	(0.27)	(0.25)
Relationship status: % type	10574			
Single		0.21	0.26	0.25
Married		0.66	0.63	0.64
Widowed		0.02	0.02	0.02
Divorced		0.08	0.08	0.08
Separated		0.03	0.02	0.02
Number of children	10574			
Mean		0.58	0.66	0.64
Standard deviation		(0.88)	(0.96)	(0.94)
Observations		2824	7995	10819

Table 3.2: Correlation table independent variables

	Altruism	Laziness	Risk aversion	Female	Age	Education	Nationality	Relationship
Altruism								
Laziness	-0.068***							
Risk aversion	0.016	-0.067***						
Female	0.147***	-0.073***	0.198***					
Age	-0.072***	-0.162***	0.098***	-0.039***				
Education	-0.004	0.024**	-0.076***	-0.049***	0.209***			
Nationality	-0.013	0.029***	-0.056***	0.017*	0.039***	0.175***		
Relationship	-0.001	-0.100***	0.034***	0.062***	0.374***	0.037***	-0.018*	
No. of children	0.057***	-0.016	0.019*	-0.049***	-0.165***	0.008	-0.082***	0.065***

Notes: Correlations calculated using 10574 observations. *, **, and *** indicate significance at the .10, .05, and .01 levels, respectively.

3.4 Results

Table 3.3 shows the estimation results of the linear probability model using the full sample. The coefficient estimates show the change in the decimal probability of working in the public sector instead of the private sector given a unit change in the independent variable. We report robust standard errors to correct for heteroskedasticity resulting from the binary structure of our response variable.

The first column shows the estimation results without taking up any control variables as well as without allowing for a possible interaction effect between altruism and laziness. The estimation results show that the likelihood that a worker is employed in the public sector is increasing in his altruism. This effect is positive and significant. A unit increase in altruism increases the likelihood of working in the public sector instead of the private sector by 3.3 percentage points. We find a weaker result for laziness. A unit increase in laziness has a positive but insignificant effect ($p = 0.117$) of 0.5 percentage points on the likelihood of working in the public sector.[15]

Next, we control for socio-demographics and risk preferences in column 2. The effect of a worker's altruism is robust in both sign and significance; the magnitude of the effect slightly decreases from 3.3 to 2.4 percentage points. We now also find a positive and highly significant effect of a worker's laziness on sector of employment. A unit increase in laziness results in a 0.9 percentage points increase in the likelihood of working in the public sector. The increase in the magnitude of the coefficient stems mainly from the inclusion of age and gender as control variables. Older people and females on average claim to be less lazy (see Table 3.2) as well as have a higher likelihood of working in the public sector (see Table 3.1). Omission of these control variables gave rise to a downward bias in the coefficient for laziness in column 1.

As discussed in the previous section, altruism is measured on a four-point scale whereas laziness is measured on a seven-point scale. We compare the effect size of altruism and laziness by computing standardized coefficients. We estimate the effect of a one standard deviation change in the independent variable on the likelihood of

[15] We have checked for nonlinear effects of altruism and laziness on the likelihood of working in the public sector and found no significant nonlinear effects.

Table 3.3: Results of the linear probability model (full sample)

Dependent variable: sector of employment	(1)	(2)	(3)
Altruism	0.033***	0.024***	0.024***
	(0.007)	(0.007)	(0.007)
Laziness	0.005	0.009***	0.009***
	(0.003)	(0.003)	(0.003)
Altruism × Laziness			0.001
			(0.005)
Risk aversion		0.005***	0.005***
		(0.002)	(0.002)
Female		0.112***	0.112***
		(0.009)	(0.009)
Age		0.009***	0.009***
		(0.002)	(0.002)
Age^2		-0.000***	-0.000***
		(0.000)	(0.000)
Education: high school (HS)		0.006	0.006
		(0.013)	(0.013)
Education: more than HS		0.242***	0.241***
		(0.015)	(0.015)
Nationality (=German)		0.092***	0.092***
		(0.014)	(0.014)
Married		0.007	0.007
		(0.014)	(0.014)
Widowed		-0.013	-0.013
		(0.036)	(0.036)
Divorced		-0.010	-0.010
		(0.019)	(0.019)
Separated		0.022	0.022
		(0.032)	(0.032)
Number of children		-0.016***	-0.016***
		(0.005)	(0.005)
Intercept	Yes	Yes	Yes
State dummies	No	Yes	Yes
Observations dep=0	7995	7792	7792
Observations dep=1	2824	2782	2782
Total observations	10819	10574	10574
R^2	0.002	0.095	0.095
Log likelihood	-6439	-5805	-5805

Notes: Heteroskedasticity robust standard errors between parentheses. Variables altruism and laziness in column (3) are centred around their sample median. *, **, and *** indicate significance based on a two-sided test at the .10, .05, and .01 levels, respectively.

working in the public sector. We find that the effect sizes of altruism and laziness are similar in magnitude. An increase by one standard deviation in altruism results in a 1.3 percentage points increase in the probability of working in the public sector. A one standard deviation increase in laziness results in a 1.4 percentage points increase in the probability of working in the public sector. These results suggest that altruism and laziness are equally important in determining a worker's sector of employment.

Several of our control variables turn out to be important in explaining a worker's sector of employment. In line with the literature on risk preferences, we find that workers who are more risk averse are significantly more likely to work in the public sector instead of the private sector. A unit increase in risk aversion results in a 0.5 percentage points higher likelihood of working in the public sector. This corresponds to a standardized effect size that is slightly smaller than the standardized effect sizes for altruism and laziness. Additionally, we find that public sector employees are more likely to be female, older, better educated, and have fewer kids. The state dummies, which control for unobserved heterogeneity between states, are jointly significant ($p < 0.01$).

Column 3 of Table 3.3 adds the interaction of altruism and laziness. In contrast to our theoretical predictions, we do not find evidence for an interaction effect between a worker's altruism and laziness. The estimate of the coefficient is insignificant and very close to zero.[16] The marginal effect of altruism on the likelihood of public sector employment does not change with laziness, as illustrated in Figure 3.3. Likewise, the marginal effect of laziness on the likelihood of public sector employment does not change with altruism, see Figure 3.4. This implies that not the most altruistic and energetic workers have the highest likelihood of being employed in the public sector, but those workers who are most altruistic and lazy. Our estimates imply that they face an estimated probability of working in the public sector of 32.8%.[17] Workers

[16] One possible interpretation for the insiginificant coefficient for the interaction term together with the significant coefficient for altruism is that public sector employees' contribution to society is (partly) independent of their effort. For instance, public sector employees may consider the wage gap between the private sector and the public sector as a donation to society. This interpretation fits well with Perry and Wise (1990)'s classic typology of public service motivation that includes both the "desire to serve" as well as the "desire to participate", where the former depends on a worker's effort while the latter does not. A recent economic model including both types of public service motivation is Delfgaauw and Dur (2010).

[17] Predicted probabilities are calculated given the mean values of all control variables. Signifi-

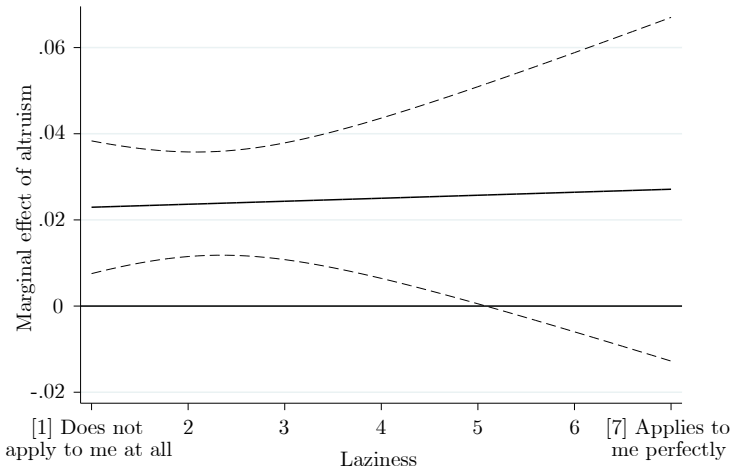

Figure 3.3: Marginal effect of altruism given a worker's laziness

Notes: Solid black line shows the estimated effect of a unit increase in altruism on the likelihood of working in the public sector given a worker's reported laziness. Dashed lines show the 90% confidence interval.

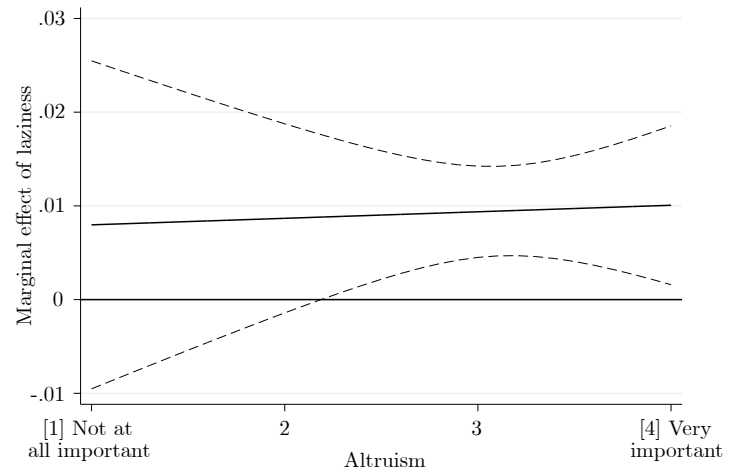

Figure 3.4: Marginal effect of laziness given a worker's altruism

Notes: Solid black line shows the estimated effect of a unit increase in laziness on the likelihood of working in the public sector given a worker's reported altruism. Dashed lines show the 90% confidence interval.

who are most altruistic and energetic are significantly less likely to work in the public sector with an estimated probability of working in the public sector of 27.1%. This probability does not differ significantly ($p > 0.10$) from the corresponding probability for workers who are most selfish and lazy, who face an estimated probability of working in the public sector of 25.7%. Workers who are most selfish and energetic are least likely to sort to the public sector, with an estimated probability of 20%.

Recent literature suggests that intrinsic motivation is a more important determinant of sorting to the public sector for higher educated workers (Lewis and Frank 2002, Dur and Zoutenbier 2014). We find evidence in line with these studies for altruism and laziness. Table 3.4 shows the regression results for subsamples of each category of education. Neither a worker's altruism nor laziness has a significant effect on sector of employment for workers with less than high school education. We do find some evidence for sorting of altruistic workers and lazy workers to the public sector among high-school graduates. We find the strongest results for workers in the highest education category. A unit increase in altruism given median laziness (altruism and laziness are median centered) increases the likelihood of working in the public sector for a highly educated worker by 3.5 percentage points. A unit increase in laziness given median altruism increases the likelihood of working in the public sector for a highly educated worker by 1.7 percentage points. The estimated interaction effect of altruism with laziness is insignificant in all education subsamples. A possible reason why altruism matters more for the sorting of higher educated workers lies in the nature of their job, with higher educated workers having more opportunities to make a significant contribution to society in a public sector job. Laziness may matter more for the sorting of higher educated workers because in Germany extrinsic rewards for performance are generally rare among less educated workers and more prevalent among better educated workers (see tables 3 and 4 in Dur et al. 2010). We find some further support for this interpretation from our result that risk aversion only matters for sector of employment of the highly educated workers. The signs and significance of the other control variables are fairly similar across all levels of education, aside from risk aversion.

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cance levels ($p < 0.01$) are calculated using delta method standard errors.

Table 3.4: Results of the linear probability model with the sample split on education level

Dependent variable: sector of employment	(1) Less than high school	(2) High school	(3) More than high school
Altruism	0.009	0.021**	0.035**
	(0.017)	(0.009)	(0.017)
Laziness	0.005	0.006*	0.017**
	(0.008)	(0.004)	(0.006)
Altruism × Laziness	0.002	-0.005	0.013
	(0.011)	(0.006)	(0.011)
Risk aversion	-0.002	0.002	0.018***
	(0.004)	(0.002)	(0.004)
Female	0.126***	0.106***	0.132***
	(0.022)	(0.010)	(0.019)
Age	0.017***	0.009***	0.016**
	(0.006)	(0.003)	(0.006)
Age^2	-0.000***	-0.000**	-0.000**
	(0.000)	(0.000)	(0.000)
Education: high school (HS)			
Education: more than HS			
Nationality (=German)	0.052**	0.093***	0.124***
	(0.025)	(0.017)	(0.045)
Married	-0.064	-0.005	0.057*
	(0.042)	(0.016)	(0.029)
Widowed	0.002	-0.052	0.097
	(0.105)	(0.042)	(0.088)
Divorced	-0.103**	-0.011	0.024
	(0.052)	(0.023)	(0.044)
Separated	-0.058	0.041	0.019
	(0.094)	(0.040)	(0.063)
Number of children	-0.005	-0.007	-0.043***
	(0.013)	(0.006)	(0.010)
Intercept	Yes	Yes	Yes
State dummies	Yes	Yes	Yes
Observations dep=0	962	5184	1646
Observations dep=1	188	1309	1285
Total observations	1150	6493	2931
R^2	0.050	0.037	0.055
Log likelihood	-458	-3162	-2022

Notes: Heteroskedasticity robust standard errors between parentheses. Variables altruism and laziness are centred around their sample median. *, **, and *** indicate significance based on a two-sided test at the .10, .05, and .01 levels, respectively.

Next, we examine heterogeneity in sorting to the public sector between industries. Relatively many jobs in the public sector involve taking care for people. Our estimates of sorting to the public sector may be confounded if altruistic (and/or lazy) workers have a particular tendency to take a job in a caring industry. Following Gregg et al. (2011), we have constructed two subsamples: the caring industries and the noncaring industries.[18] Table 3.5 reports the regression results for these subsamples. While the coefficients for laziness hardly differ between industries, there is a big difference between industries in sorting of altruistic workers to the public sector. As compared to the full sample, the sorting of altruistic workers to the public sector is much stronger in the caring industries and is virtually absent in the noncaring industries. These results nicely fit with those of Gregg et al. (2011) for the UK. As in the full sample, we do not find significant interaction effects of altruism and laziness in the subsamples.

Finally, we explore whether the differences in altruism and laziness that we have found are more or less pronounced for more experienced employees. As discussed in section 3.1, sorting may be related to work experience in two important ways. First, workers might spend time at the start of their career on finding a job that is a good match with a workers' tastes and abilities (as in the 'job shopping' models by Johnson 1978, Jovanovic 1979, and Neal 1999). Following this line of reasoning we expect weaker sorting patterns for workers with little work experience. Second, sorting patterns may also be stronger or weaker for more experienced workers when workers adapt their preferences to the prevailing organizational culture (see Brewer 2008). Following this line of reasoning workers become more or less altruistic and lazy by working in the public sector. In Table 3.6, we show the results of regressions that include an interaction of altruism and (full-time) work experience, and of laziness and (full-time) work experience (measured in years).[19] The first column shows that

[18] The following 2 digit industry classifications are labeled a caring industry: Education and Sport, Health Service, Service Industries, Voluntary Church, and Private Household. The remaining 2 digit industry classifications are labeled a noncaring industry: Agriculture and Forestry, Fisheries, Energy and Water, Mining, Chemicals, Synthetics, Earth, Clay and Stone, Iron and Steel, Mechanical Engineering, Electrical Engineering, Wood, Paper and Print, Clothing and Textile, Food Industry, Construction, Construction Related, Wholesale, Other Transport, Financial Institutions, Insurance, Restaurants, Trash Removal, Other Services, and Public Administration.

[19] Unfortunately, we only have data on worker's aggregate work experience, not on work expe-

Table 3.5: Results of the linear probability model with the sample split on industry

Dependent variable: sector of employment	(1) Caring industries	(2) Noncaring industries
Altruism	0.039**	0.003
	(0.016)	(0.008)
Laziness	0.007	0.009***
	(0.007)	(0.003)
Altruism × Laziness	0.004	-0.002
	(0.010)	(0.005)
Risk aversion	0.014***	0.003
	(0.004)	(0.002)
Female	0.071***	0.046***
	(0.020)	(0.010)
Age	0.023***	0.006**
	(0.006)	(0.003)
Age^2	-0.000***	-0.000**
	(0.000)	(0.000)
Education: high school (HS)	-0.006	0.021*
	(0.035)	(0.012)
Education: more than HS	0.127***	0.221***
	(0.036)	(0.017)
Nationality (=German)	0.112***	0.078***
	(0.041)	(0.013)
Married	-0.003	0.018
	(0.030)	(0.014)
Widowed	-0.000	0.002
	(0.075)	(0.037)
Divorced	-0.020	0.004
	(0.041)	(0.020)
Separated	0.011	0.039
	(0.063)	(0.036)
Number of children	-0.031***	-0.012**
	(0.010)	(0.005)
Intercept	Yes	Yes
State dummies	Yes	Yes
Observations dep=0	1628	5883
Observations dep=1	1494	1238
Total observations	3122	7121
R^2	0.046	0.073
Log likelihood	-2190	-2924

Notes: Heteroskedasticity robust standard errors between parentheses. Variables altruism and laziness are centred around their sample median. *, **, and *** indicate significance based on a two-sided test at the .10, .05, and .01 levels, respectively.

Table 3.6: Results of the linear probability model including the interaction of altruism and laziness with total work experience

Dependent variable: sector of employment	(1)	(2)
Altruism	0.027**	0.038***
	(0.012)	(0.014)
Laziness	0.002	0.006
	(0.005)	(0.006)
Work experience	0.001	0.009
	(0.002)	(0.006)
Altruism × work experience	-0.000	-0.002
	(0.001)	(0.002)
Laziness × work experience	0.001**	-0.000
	(0.000)	(0.001)
Work experience^2/100		-0.023
		(0.016)
Altruism × work experience^2/100		0.006
		(0.005)
Laziness × work experience^2/100		0.002
		(0.002)
Intercept	Yes	Yes
Control variables	Yes	Yes
State dummies	Yes	Yes
Observations dep=0	7786	7786
Observations dep=1	2781	2781
Total observations	10567	10567
R^2	0.095	0.095
Log likelihood	-5799	-5798

Notes: Heteroskedasticity robust standard errors between parentheses. Control variables included in estimation are risk aversion, gender, age, age squared, education, nationality, marital status, and number of children. The variable work experience is measured in years. *, **, and *** indicate significance based on a two sided test at the .10, .05, and .01 levels, respectively.

a unit increase in altruism for workers with no work experience, results in a positive and significant effect of 2.7 percentage points on the likelihood of working in the public sector.[20] This suggests that altruistic workers already at the start of their

rience within a sector.

[20] We additionally examined sorting by workers who started their career only after their altruism and laziness had been measured (that is, workers who took their first job between 2005 and 2010). This certainly precludes any feedback effects from working in a particular sector on personality traits, but does pose difficulties in obtaining a sufficiently large sample size. The results of this estimation are very similar in sign and magnitude as compared to the estimates for workers with low levels of work experience in Table 3.6. However, we do not find statistically significant results, which could well be due to the very limited sample size.

career self-select to the public sector. We do not find a clear relation between a worker's altruism and work experience in the likelihood of public sector employment. The interaction effect of altruism and work experience is negative and insignificant. This result is in contrast with a number of previous studies that do find a significant decrease in public sector worker's altruism with work experience (Blau 1960, Van Maanen 1975, Moynihan and Pandey 2007, De Cooman et al. 2009, and Buurman et al. 2012). The second column allows the effect of altruism to depend nonlinearly on work experience.[21] The combined interaction effects are interpreted by looking at the marginal effect of altruism given the number of years of work experience. This marginal effect is illustrated in Figure 3.5. We find that even though the effect of a worker's altruism slightly declines with work experience in the first few years of a worker's career, the effect slightly increases in the last years of a worker's career. Hence, overall, there is not a very clear relation between a worker's altruism and his work experience. Public sector employees are more altruistic as compared to their private sector counterparts at the start of their career, and by and large it remains like this throughout their career. For laziness, we do find a striking pattern. Column 1 shows that the effect of a unit increase in laziness for workers with low levels of work experience is insignificant and very close to zero. However, the effect of laziness increases for workers with higher levels of work experience. The estimated interaction effect of laziness with work experience is 0.1 percentage points and significant. The second column adds an interaction between a worker's laziness and work experience squared. Figure 3.6 illustrates the estimated marginal effect of laziness including the interaction effects of laziness and work experience and laziness and work experience squared. We find that a worker's laziness becomes more important for sorting as work experience increases. Whether this stems from preference adaptation or delayed self-selection cannot be assessed due to the cross-sectional nature of our data.[22]

[21] We have also estimated our regression including nonlinear terms for altruism and laziness. We find no evidence of nonlinearities in altruism and laziness.

[22] To be sure, the SOEP is a panel, but the survey question on laziness was included only recently.

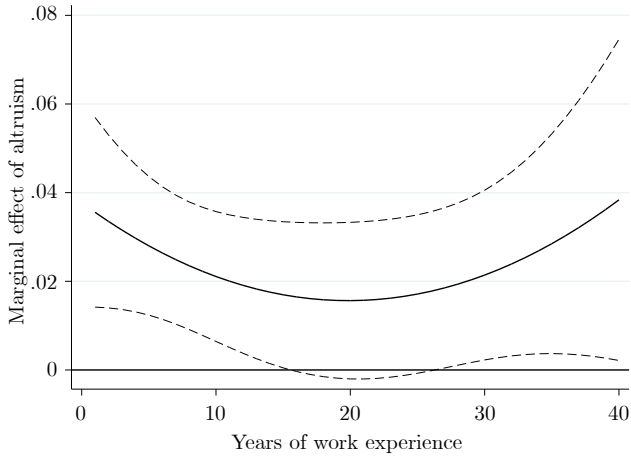

Figure 3.5: Marginal effect of altruism given the years of work experience

Notes: Solid black line shows the estimated effect of a unit increase in altruism on the likelihood of working in the public sector for a given number of years of work experience. Dashed lines show the 90% confidence interval.

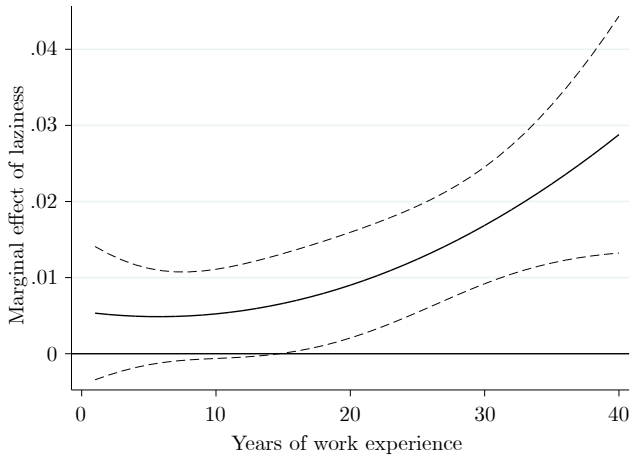

Figure 3.6: Marginal effect of laziness given the years of work experience

Notes: Solid black line shows the estimated effect of a unit increase in laziness on the likelihood of working in the public sector for a given number of years of work experience. Dashed lines show the 90% confidence interval.

3.5 Concluding remarks

We have studied how intrinsic motivations of public sector employees compare to those of private sector employees using a representative sample of German workers. In line with our theoretical predictions, we have found that public sector employees are significantly more altruistic than private sector employees. This difference is already present at the start of people's career and is more pronounced among highly educated employees and in caring industries. We have also found that public sector employees are significantly more lazy than private sector employees. This difference only shows up for more experienced employees, which could be due to early-career 'job shopping' or to preference adaptation. Lastly, we did not find evidence for our theoretical prediction of a negative interaction between altruism and laziness in the sorting to the public sector, which may indicate that public sector employees' contribution to society is (partly) independent of their effort. Together these results imply that workers who are both highly altruistic and lazy have the highest likelihood of sorting to the public sector (with a predicted probability of 33%), whereas selfish and highly energetic workers have the lowest likelihood of sorting to the public sector (with a predicted probability of 20%).

A natural next step would be to include wages in the empirical analysis, as in the endogenous switching regression models by Van der Gaag and Vijverberg (1988), Hartog and Oosterbeek (1993), and Dustmann and Van Soest (1998). Our theory predicts that wages in the private sector decrease in a worker's laziness and are independent of his altruism, whereas public sector wages are flat. It would be interesting to learn how much of the differences in personality characteristics between public sector and private sector employees that we have found in this study can be attributed to differences in the wage returns to altruism and laziness between sectors. Such a study does pose the challenge of finding variables that are credibly exogenous to wage determination but not to selection (or the other way around).

Chapter 4

The Impact of Matching Mission Preferences on Well-being at Work

4.1 Introduction

Many organizations have a clearly defined mission statement. This statement describes the key purpose and main objectives of the organization. Government organizations have little leeway in establishing their organization's mission, as their mission is set by the politicians in office. The objectives specified in the government's mission statement are carried out by workers that are employed by the government sector. However, government workers may have their own preferences regarding the choice of available objectives to work on. Hence, the preferences of a government worker are not necessarily aligned with the preferences of the politicians in office.

Recent studies in economics have formalized this idea and have stressed the importance of the alignment of mission preferences between an agent and a principal (Besley and Ghatak 2005, Dur and Zoutenbier 2014). A common prediction is that workers enjoy a 'mission' premium in jobs where their mission preferences match the employer's mission preferences. That is, workers enjoy working on objectives that are in line with their own preferences regarding the available objectives. Closely related is the rich literature on person-organization fit in organizational psychology, that has emphasized the importance of congruence of values between a worker and an

organization for attraction, retention, and performance (Kristof 1996). The theory of person-organization fit has also been studied in a public sector context. Studies in public administration have shown that public sector workers who find it important to be able to help others, report higher job satisfaction in jobs that offer the opportunity to help others (Bright 2008, Steijn 2008, Taylor 2008, and Wright and Pandey 2008).

This chapter studies the importance of matching mission preferences for government workers using survey panel data covering Dutch workers. More specifically, I test whether government workers are more satisfied with their job if their mission preferences are better aligned with the mission of the government in office. While previous studies have mainly used cross-sectional data on 'mission alignment' or 'value congruence', this chapter exploits panel data from the Longitudinal Internet Studies for the Social sciences (LISS). The sample covers a period from 2008 up to 2011, which allows to observe workers under different government compositions and, therefore, different government missions. The detailed questions on respondents' occupation details, political preferences, and individual characteristics offer a unique opportunity to examine the effects of the alignment of mission preferences in the government sector. A worker's mission alignment is measured by comparing a worker's reported vote in parliamentary elections to the outcome of the formation of a coalition government after the election. The preferences of a worker are classified as a match to those of the government when a worker voted for one of the political parties that is in office after the election. A worker's preferences do not match when a worker voted for one of the political parties that is not in office after the elections. Next, self-reported job satisfaction is used to measure a worker's well-being in a job. Job satisfaction is measured by the question: "How satisfied are you with the type of work that you do?" This facet of job satisfaction relates most closely to a worker's satisfaction with work itself (which is of prime interest given the subject of study). Finally, I restrict the focus of the analysis to workers who are employed in the government sector rather than all workers in the public sector. The measure of mission alignment used in this chapter seems more important for those workers under the most direct control of the politicians in office. In contrast, the measures used in the previously mentioned studies on person-organization fit apply more widely to all

jobs in the public sector.

The results of the empirical analysis are in line with the hypothesis. I find clear evidence of a premium in job satisfaction on the matching of mission preferences in the government sector. Government workers report significantly higher job satisfaction when they match on political preferences to the political parties in office as compared to when their preferences do not match. The estimated difference in reported job satisfaction is 0.391 points on a eleven-point scale. The size of this effect is substantial, it is comparable to the effect of half an hour reduction in commuting time and is even larger than the effect of having to work overtime on a regular basis. The effect of a match of political preferences is insignificant for workers employed outside the government sector. Additionally, the results are robust to including both individual and time fixed effects and controlling for a rich set of individual characteristics (age, education level, and health) and job characteristics (working hours, income, overtime, irregular hours, supervising task, commuting time, tenure, and job type).

My results nicely complement the existing empirical studies on person-organization fit. Moreover, studies on job satisfaction in economics have found that public sector workers report higher job satisfaction as compared to private sector workers (see, e.g., Clark and Senik 2006). I find a similar result. Government workers report, on average, higher job satisfaction as compared to workers employed outside the government sector. Interestingly, this difference is partly explained by the matching of political preferences. Only those workers who match on political preferences to the political parties in office enjoy significantly higher job satisfaction when employed in the government sector. The estimated effect on job satisfaction is positive but insignificant for a nonmatching worker at 0.420 points, but is highly significant and doubles in size for a matching worker (with an estimated effect of 0.819 points).

Previous studies have shown that mission motivation is especially important for higher educated workers (Lewis and Frank 2002, Dur and Zoutenbier 2014). In contrast to these studies I find that matching political preferences are particularly important for government workers with intermediate levels of education. The effect of a match of political preferences is almost twice as large for government workers

in the intermediate education categories as compared to the full sample of workers. The results for workers in the lowest or highest education categories are slightly weaker as compared to the full sample.

In a parliamentary system, such as the Dutch system, a government in office usually consists of a coalition of political parties rather than a single political party. This implies that even when a worker's preferred political party (as measured by their vote) makes it into government, it is still possible that this party will form a coalition with political parties that are conflicting with a worker's preferences. Information on a worker's reported stance towards each political party is used to investigate this. My results show that it is not only important if the party a worker voted for takes up office, but also how a worker rates all of the political parties in a coalition. Government workers with a more positive attitude towards all coalition parties report significantly higher job satisfaction as compared to workers with a more negative stance. A similar effect is found when assessing the relative difference in a worker's stance towards the coalition parties as compared to a worker's stance towards the opposition parties. Government workers who rate the coalition parties more favorably than the opposition parties report significantly higher job satisfaction. The reverse is found for government workers who rate the coalition parties more negatively than the opposition parties.

I continue as follows. The next section briefly discusses the relevant literature on job satisfaction. Section 4.3 describes the data used in testing and explains the empirical strategy. The results of the empirical analysis are reported and discussed in section 4.4. Section 4.5 concludes.

4.2 Related literature

There is a growing literature in economics on people's subjective well-being (see Frey and Stutzer 2002 for an extensive discussion on well-being measures and applications). A main field of interest in this literature is well-being at work or job satisfaction. Following the seminal paper by Freeman (1978), a number of studies have examined the role of job satisfaction as a predictor of labor market outcomes.

These studies have documented strong associations between job satisfaction and behavior in the workplace, such as job quits (Akerlof et al. 1988, Clark et al. 1998, and Shields and Ward 2001), absence rates (Clegg 1983), and counterproductive activities in the workplace (Mangione and Quinn 1975). A second strand of job satisfaction literature has examined the determinants of a worker's job satisfaction. Job satisfaction has been explained by a variety of different individual and job characteristics such as: a worker's age, gender, education, wage and tenure (Hamermesh 1977, Borjas 1979, Clark and Oswald 1996, Clark 1997).

More recently, a number of studies have examined differences in subjective well-being between public sector and private sector employment (Blanchflower and Oswald 1999, Cabral Viera 2005, Diaz-Serrano and Cabral Viera 2005, Demoussis and Giannakopoulos 2007, and Ghinetti 2007). The evidence on a public-private sector differential in subjective well-being is mixed across countries. However, for most countries a public sector premium is found for a variety of different facets of job satisfaction. It is often argued that this differential in job satisfaction is a result of intrinsic motivation or high job security in the public sector (see, e.g., Luechinger et al. 2006).

Few studies have tried to empirically explain differences in subjective well-being between public sector and private sector workers. A notable exception is a study by Luechinger et al. (2008). They find that differences between countries in public-private sector life satisfaction differentials are partly explained by cross-country differences in regulatory policies and institutional constraints for the public sector.[1] Other studies have attributed the difference in subjective well-being between public sector and private sector workers to sorting. Heywood et al. (2002) use data on British workers and find no evidence of a public sector premium after controlling for unobserved heterogeneity between individuals. This indicates that the positive premium found in some studies is mainly the result of sorting. People who tend to report greater subjective well-being are more likely to work in the public sector (this is confirmed in a study by Luechinger et al. 2010). These results generalize to a number of facets of job satisfaction such as satisfaction with work itself, pay,

[1] A worker's job satisfaction is often considered as part of a worker's general subjective well-being or life satisfaction (Clark and Oswald 1996 and Van Praag et al. 2003).

and the relation with the boss. Lastly, Clark and Senik (2006) do find a significant premium for public sector workers in Britain and France after controlling for unobserved heterogeneity between individuals. However, they do not condition on wages indicating that these rents are (partly) a result of wage rents in the public sector (although for the French sample this is less likely). Again, these results generalize to a number of facets of job satisfaction including satisfaction with work itself.

Closely related to this chapter are studies in public administration that examine how person-organization fit relates to job satisfaction using data on public sector workers. A common finding in this literature is that public sector workers who rate it important to help others, and in addition, find that their job offers the opportunity to help others report higher job satisfaction as compared to public sector workers who do not find that their job offers the opportunity to help others (Bright 2008, Steijn 2008, Taylor 2008, and Wright and Pandey 2008). Additionally, Leisink and Steijn (2009) show that these workers also report a higher willingness to exert effort.[2] This chapter differs from the studies on person-organization fit in two ways. First, this chapter uses data on workers from all sectors of the economy, which allows to compare the found results on government workers to nongovernment workers. Second, studies on person-organization fit have used only cross sectional variation in 'mission matching' to determine an effect on job satisfaction whereas this chapter exploits variation within the individual over time.

After completing a first draft of this chapter I became aware of a closely related paper by Tabvuma et al. (2014). They use data on British public sector workers to study gender differences in the effect of political preferences on job satisfaction. Tabvuma et al. find no effect of matching political preferences for female public sector workers and only a weak and temporary effect for male public sector workers.

[2]Closely related to this study are a number of (field and lab) experiments in economics on mission motivation (Tonin and Vlassopoulos 2010, 2012, Gerhards 2012, Carpenter and Gong 2013, and Fehrler and Kosfeld 2014). These studies invariably find that participants with aligned mission preferences exert more effort in a chosen or real effort experiment as compared to participants with conflicting mission preferences.

4.3 Data and empirical strategy

The data used in this chapter come from the Longitudinal Internet Studies for the Social sciences (LISS), conducted by CentERdata.[3] The LISS panel is a representative panel for the Dutch population aged 16 and older, covering roughly 5,000 households. Panel participants were selected through random sampling from the community registers of Statistics Netherlands. The LISS panel is an unbalanced panel, the first wave dates back to 2008 and the most recent wave has been completed in 2012. Panel members are contacted on a monthly basis to answer questions from a specific survey module. The panel includes modules on work and schooling, health, political values, and a survey on a number of demographic characteristics. Each module is administered only once a year (with exception of the demographic survey) resulting in a yearly survey data structure.

The key variables of interest from this data set are a worker's political preferences, job satisfaction, and industry of employment. Workers' political preferences, as measured by the question: "For which party did you vote in the parliamentary elections of [22 November 2006/9 June 2010]?", are used to construct a variable indicating whether a worker matches on mission preferences to the government in office. A worker is considered as a match when the political party that the worker has voted for in the foregoing elections has taken up office in that specific time period.[4] A worker is classified as not matching when a worker indicated to have voted for a political party that has not become part of the government in office.[5]

Furthermore, the survey includes a number of statements on facets of job satisfaction (such as wage, hours, career, atmosphere at work, and type of work). Respon-

[3] For more information on the LISS panel study see www.lissdata.nl.

[4] The Netherlands has a parliamentary political system with proportional representation in the house of representatives. In a parliamentary system, political parties that have a (coalition) majority in the house of representatives are able to take office as a government. Such a majority is sufficient to implement policies. Political parties in office after the elections of November 2006 are CDA (Christian Democrat party), PvdA (Labor party), and CU (Christian Union party). Political parties in office after the elections of June 2010 are VVD (Liberal party) and CDA (Christian Democrat party) with support of the PVV (Freedom party) in parliament.

[5] A possible bias would occur if people are dishonest about revealing their vote in the foregoing parliamentary elections. While it is not possible to observe whether a respondent reports honestly, respondents were given the opportunity to indicate that they "do not know" what they had voted or indicate that they "prefer not to say" on which party they voted. The number of observations in these categories is very low, namely between 1 and 5 percent each year.

dents were asked to score themselves on a eleven-point scale ranging from "Not at all satisfied" to "Fully satisfied". I use the facet of job satisfaction that relates most closely to satisfaction with work itself, measured by the question: "How satisfied are you with the type of work that you do?"[6]

Finally, respondents indicated their sector of employment by answering the question: "In what sector do you work?" Respondents who answered: "Government Services, Public Administration and Mandatory Social Insurances" are labelled as a government worker, those who answered differently are labeled as a nongovernment worker.[7] The focus of the analysis is on government workers rather than all workers in the public sector. Government workers are under most direct control of the government and, therefore, should benefit most when their preferred political party is in office.

The sample is restricted to observations from the 2008 to 2011 wave. The 2012 wave is excluded from the analysis because at the time of data collection there was no active government in office, making it difficult to define the matching variable. This restriction leads to a sample of 1,714 unique observations for whom there is data on employment details, political preferences, and a number of demographic variables.

Two methodical issues arise when trying to estimate the effect of a worker's political preferences on a worker's job satisfaction using longitudinal data. First, a test proposed by Wooldridge (2002, pp. 290-291) shows that the fixed effects model is preferred to the random effects model ($p < 0.01$), to account for unobserved heterogeneity between individuals.[8] The second issue relates to the ordinal nature of the measure of job satisfaction. Several solutions have been put forth to account

[6]The results of the analysis are similar but slightly weaker when measuring job satisfaction by the more general question: "How satisfied are you, all in all, with your current work?". No significant effect is found on a worker's satisfaction with wages, hours worked, career, or atmosphere at work.

[7]Other answer categories include: Agriculture, Forestry, Fishery and Hunting, Mining, Industrial Production, Utilities, Construction, Retail trade, Catering, Transport, Storage and Communication, Financial, Business Services, Education, Healthcare and Welfare, Environmental Services, Culture, Recreation and other services, and Other.

[8]In contrast to the Hausman test, the test proposed by Wooldridge (2002) allows for clustering of errors at the individual level.

for endogeneity of individual effects in models estimating ordinal relationships.[9] A drawback of these ordinal fixed effects methods is that the estimated coefficient size is very difficult to interpret due to the inability to estimate ordinal category thresholds. Given that the ordinal fixed effects methods offer no benefits in interpretation over the linear fixed effects specification, I use a cardinal scale of job satisfaction in the estimation. Geishecker and Riedl (2012) show that the assumption of cardinality still allows to interpret the results in ratio's of parameter estimates. A feel for the size of an effect can be obtained by comparisons with other estimates from the same regression.

The following specification is used in estimation:

$$JS_{it} = \delta G_{it} + \theta M_{it} + \psi(G_{it} \times M_{it}) + x'_{it}\beta + \alpha_i + \tau_t + \varepsilon_{it}. \tag{4.1}$$

The dependent variable, denoted by JS_{it}, is the reported job satisfaction of worker i at time period t. The main variables of interest are a dichotomous variable G_{it} indicating whether a worker is employed in the government sector or not, a dichotomous variable M_{it} indicating whether a worker matches on political preferences to the government in office or not, and an interaction between the government variable and the matching variable. Additionally, I include time varying control variables x_{it}, individual fixed effects α_i, and time fixed effects τ_t. Following the hypothesis, I would expect that a match of political preferences has no effect when a worker is not employed in the government sector, so $\theta = 0$. Whereas for workers employed in the government sector a match of political preferences should have a positive effect $\theta + \psi > 0$, because such a worker can work on policy measures that are in line with a worker's own preferences regarding such a policy.

[9] See for instance Winkelmann and Winkelmann (1998) who suggest to choose a cut-off point and estimate a fixed effect binary logit, Ferrer i Carbonell and Frijters (2004) who allow cut-off points to differ over individuals, and Das and Van Soest (1999) or Baetschmann et al. (2011) who combine estimates for each possible cut-off point made possible by the data.

Table 4.1 shows the descriptive statistics of the sample including a short description of each variable used in estimation. Average job satisfaction in the sample is around 7.7 on a scale to 10. Roughly 13 percent of all respondents are employed in the government sector, corresponding to 131 to 189 observations each year. The fraction of workers that voted for a political party that has become part of the government in office varies between 44 and 47 percent each year.

Table 4.1: Description of variables used in regression

Variable	Description	Mean	Std.dev.
Job satisfaction	Self-reported job satisfaction on a 0-10 scale.	7.71	1.46
Government	Variable indicating 1 if a worker is employed in the government sector.	0.13	0.34
Match	Variable indicating 1 if a worker matches on political preferences to the political parties in office.	0.46	0.50
Age	Age in years.	44.93	10.82
Education level	Highest attained level of education (Statistics Netherlands categories): 1=primary school, 2=intermediate secondary, 3=higher secondary, 4=intermediate vocational, 5=higher vocational, and 6=university.	4.08	1.34
Subjective health	Self-reported health: 1=poor, 2=moderate, 3=good, 4=very good, and 5=excellent.	3.27	0.70
Hours	Contracted weekly work hours.	31.77	9.48
Income	Gross monthly income in euro's.	2819	1651
Overtime	Required to work overtime measured by: 1=never, 2=sometimes, and 3=often.	1.94	0.60
Irregular hours	Required to work irregular hours measured by: 1=never, 2=sometimes, and 3=often.	1.67	0.76
Supervisor	Variable indicating 1 if a worker has supervising tasks.	0.32	0.47
Commuting time	Travel time in minutes.	27.96	21.95
Tenure	Years employed by current organization.	12.55	10.82
Job classification	Worker classifications include: 1=agrarian, 2=blue collar, and 3=white collar.		

Table 4.2: Distribution of reported votes over political parties

Political party	Nongovernment employment	Government employment	Difference
Christian Democrats (CDA)	0.20	0.17	-0.03*
Labor party (PvdA)	0.19	0.25	0.06***
Liberal party (VVD)	0.18	0.18	0.00
Socialist party (SP)	0.16	0.11	-0.05***
Green party (GroenLinks)	0.08	0.06	-0.02**
Freedom party (PVV)	0.06	0.06	0.00
Social-Liberal party (D66)	0.05	0.06	0.01
Christian Union party (CU)	0.04	0.07	0.03***
Animal Welfare party (PvdD)	0.02	0.01	0.01
Christian Reformed party (SGP)	0.01	0.01	0.00
Other	0.01	0.01	0.00

Notes: A worker's reported vote is measured by the question: "For which party did you vote in the parliamentary elections of [date of election]?" *, **, and *** indicate a significant difference at the .10, .05, and .01 levels, respectively.

Figure 4.1 shows that the difference in job satisfaction between government workers and nongovernment workers is relatively small over the observation period. Looking closer at the job satisfaction of government workers over time in Figure 4.2, I find that job satisfaction of matching government workers is slightly higher as compared to nonmatching government workers in each observation year (although only significantly so in 2008 and 2010). Additionally, Table 4.2 shows the distribution of reported votes over political parties. Almost 75 percent of all workers voted for one of the four larger political parties. The remaining 25 percent of workers indicated to have voted for one of the many smaller parties. The differences in reported voting between government and nongovernment workers are small. There are a few exceptions, for instance, government workers are more likely to vote Labor party or Christian Union and less likely to vote Christian Democrats party, Socialist party, or Green party.[10]

[10] A number of studies have examined the political preferences of government workers. These studies find that government workers, as compared to the general population, are more likely to be left-wing orientated (Rattso and Sorensen 2013), although this does not always translate into a higher likelihood to vote for left-wing or socialist parties (Knutsen 2001, 2005, and Jensen et al. 2009).

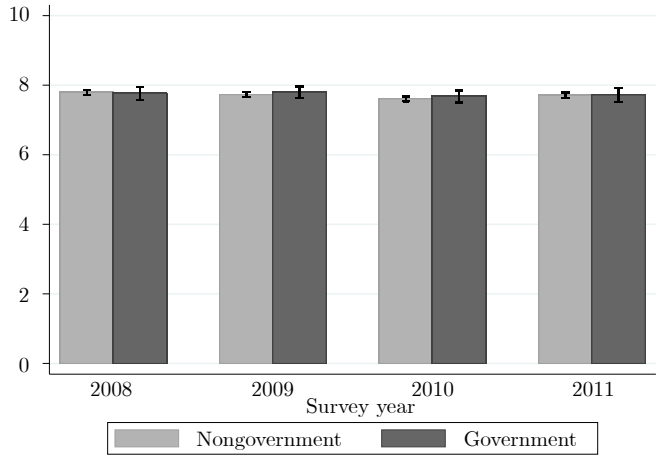

Figure 4.1: Average job satisfaction over the observation period by sector

Note: Histogram shows the average reported job satisfaction in each year including a 90% confidence interval.

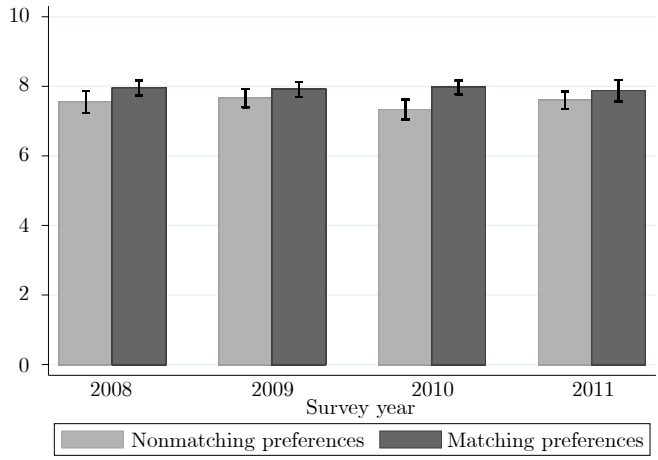

Figure 4.2: Average job satisfaction of government workers over the observation period

Note: Histogram shows the average reported job satisfaction in each year including a 90% confidence interval.

4.4 Results

Table 4.3 shows the results of the linear fixed effects estimation using the full sample of workers. The size of the coefficient estimates should be interpreted with some caution due to the ordinal nature of the response variable.[11] The reported standard errors are clustered at the individual level to account for correlation of errors over time within the individual. The first estimation includes only a dummy that indicates whether a worker is employed in the government sector and a dummy indicating whether a worker matches on political preferences to the political parties in office. In line with previous literature, I find that workers in the government sector report higher levels of job satisfaction as compared to workers in other sectors. The difference in reported job satisfaction is 0.578 and significant. The effect of a match of political preferences for workers in all sectors in the economy is insignificant and very close to zero (with a point estimate of 0.001).

The second column of Table 4.3 additionally includes an interaction between a worker's sector of employment and the variable match. Results show that government workers are significantly more satisfied with their job when their political preferences match those of the political parties in office as compared to when their preferences do not match. The estimated interaction effect of government employment with match is positive and highly significant. The interaction effect is interpreted by looking at marginal effects. A match of political preferences for workers in the government sector is associated with significantly higher job satisfaction; the estimated effect $(\theta + \psi)$ is 0.349 with a p-value of 0.03. In contrast, a match of political preferences for workers outside the government sector seems to be of little importance for a worker's reported job satisfaction. The marginal effect of a match is slightly negative at -0.050 but highly insignificant. This result clearly indicates a premium in job satisfaction on the matching of political preferences in

[11] It is important to note that all of the reported main results are robust to performing the analysis using an ordinal fixed effects method (see table 4.A in Appendix 4.A). This result is in line with Ferrer i Carbonell and Frijters (2004) who find evidence that the bias of the linear fixed effects estimator is generally small when using ordinal data. The ordinal fixed effects estimator used in comparison is the 'blow-up and cluster' estimator (see Baetschmann et al. 2011 for an extensive discussion). Geishecker and Riedl (2012) show that this method performs as well as or better than the other available ordered fixed effects methods.

Table 4.3: Results of the fixed effects estimation on job satisfaction

Dependent variable: job satisfaction	(1)	(2)	(3)
Government	0.578**	0.420	0.325
	(0.291)	(0.269)	(0.280)
Match	0.001	-0.050	-0.042
	(0.047)	(0.048)	(0.048)
Government × Match		0.399**	0.433***
		(0.164)	(0.165)
Age			-0.165
			(0.102)
Age^2			0.003***
			(0.001)
Education level:[a]			
- Intermediate secondary			-0.041
			(0.276)
- Higher secondary			0.094
			(0.280)
- Intermediate vocational			-0.415
			(0.254)
- Higher vocational			-0.049
			(0.247)
- University			-0.146
			(0.295)
Subjective health score:[b]			
- Moderate			0.694
			(0.505)
- Good			0.836
			(0.512)
- Very good			0.799
			(0.512)
- Excellent			0.887*
			(0.513)
Work hours			-0.010
			(0.007)
Log(income)			0.556***
			(0.197)
Overtime:[c]			
- Sometimes			-0.120*
			(0.065)
- Often			-0.252***
			(0.089)

Continued on next page

Table 4.3 - continued from previous page

Dependent variable: job satisfaction			
	(1)	(2)	(3)
Irregular hours:[c]			
- Sometimes			0.026
			(0.056)
- Often			0.011
			(0.110)
Supervisor			0.056
			(0.111)
Commuting time			-0.014***
			(0.005)
Commuting time^2			0.000***
			(0.000)
Tenure			-0.008
			(0.008)
Job classification:[d]			
- Blue collar			0.873*
			(0.525)
- White collar			1.237***
			(0.438)
Individual fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes
Observations	5161	5161	5161
Individuals	1714	1714	1714
Log likelihood	-6012	-6006	-5953

Notes: Standard errors between parentheses are clustered at the individual level. [a]Reference category: "primary education". [b]Reference category: "poor health". [c]Reference category: "never". [d]Reference category: "agrarian". *, **, and *** indicate significance based on a two sided test at the .10, .05, and .01 levels, respectively.

the government sector.[12]

A number of recent studies have shown that public sector workers report significantly higher levels of job satisfaction as compared to private sector workers (although this result is not robust to controlling for individual fixed effects and income, see Heywood et al. 2002). I find no significant effect of government employment on job satisfaction for workers who do not match on political preferences to the political

[12]Additionally one may wonder whether all workers in the public sector enjoy higher job satisfaction when their political preferences match those of the political parties in office. Robustness analyses show that public sector workers experience a small but highly insignificant mission premium. This indicates that the findings in this chapter are indeed specific to workers employed in the government sector rather than all workers in the public sector.

parties in office. The conditional coefficient is positive at 0.420 but insignificant. In contrast, becoming a government worker seems to have a particularly positive effect when a worker has matching political preferences. The marginal effect doubles in size (0.819) and is highly significant ($p = 0.01$).

Next, column 3 includes a number of time varying demographic and job characteristics as control variables. The effect of a match of political preferences for government workers is robust in both sign and significance; the effect increases slightly from 0.349 to 0.391 and remains highly significant.[13] Likewise, the effect of a match of political preferences for workers outside the government sector reduces slightly from -0.050 to -0.042 and remains insignificant. Several of the demographic control variables turn out to have a significant impact on job satisfaction. Older workers are less satisfied with their job as compared to younger workers, although this effect is decreasing as workers grow older. The results do not show a clear effect of education. The lowest and highest educated workers are more or less equally satisfied with their job but the intermediate educated workers are much less satisfied (although marginally insignificant $p = 0.102$). A workers subjective health score seems to matter only when the assessed health is very poor. Workers with at least moderate levels of health enjoy similar levels of job satisfaction. There are also some remarkable effects of job characteristics on job satisfaction. For instance, workers who are expected to work overtime and workers who need to travel long to get to work are significantly less satisfied with their job. On the other hand, a worker's reported job satisfaction increases in the gross monthly income of a worker. Finally, the time fixed effects, which control for unobserved differences between years, are jointly significant ($p < 0.01$).

[13] A feel for the size of the estimated effects is found by comparing the estimates for the key variables to the estimates of the control variables. For instance, the effect of a match of political preferences for government workers (0.391) is equivalent to a half an hour reduction in daily (one way) commuting time and is even larger than the effect of having to work overtime on a regular basis.

Table 4.4: Marginal effects by education level

	(1) Low education	(2) Intermediate education	(3) High education
Marginal effect of match:			
Nongovernment employment	-0.097	-0.094	0.013
	(0.120)	(0.085)	(0.065)
Government employment	0.360	0.697**	0.228
	(0.322)	(0.291)	(0.223)
Marginal effect of government employment:			
Nonmatching preferences	0.316	-0.044	0.488
	(0.362)	(0.376)	(0.340)
Matching preferences	0.773**	0.748*	0.703*
	(0.394)	(0.395)	(0.412)

Notes: Marginal effects calculated based on equation (4.1) with additional two-way and three-way interactions between the variables match, government, and education. The variable education is recoded into (1) low education: primary school or intermediate secondary, (2) intermediate education: higher secondary or intermediate vocational, and (3) high education: higher vocational or university. Delta method standard errors between parentheses. *, **, and *** indicate significance based on a two sided test at the .10, .05, and .01 levels, respectively.

Previous research has shown that mission motivation is more important for higher educated workers (Lewis and Frank 2002, Dur and Zoutenbier 2014). To assess differences between education levels I estimate equation (4.1) including all two-way and three-way interactions between the variables government, match and three education dummies (low education, intermediate education, and high education).[14] Table 4.4 reports the marginal effects for each education category. In contrast to the previous literature I find that not the highly educated government workers but the intermediate educated government workers are affected most by matching mission preferences. The effect of a match of political preferences for intermediate educated government workers is 0.697 and highly significant. The marginal effect for low or high educated government workers is smaller and almost of equal size to the full sample, but in-

[14]The low education category contains all workers who have completed only primary school or intermediate secondary education, the intermediate education category includes all workers who have completed higher secondary or intermediate vocational education, and the high education category includes all workers who have completed higher vocational or university education.

significant. In line with the main results, a match of political preferences has no effect on job satisfaction in any education category for workers employed outside the government sector. The differences between education levels in the effect of matching political preferences for government workers is mainly explained by differences in the marginal effect of government employment for nonmatching workers. Table 4.4 additionally shows the marginal effect of government employment for matching and nonmatching workers. Becoming a government worker has the same effect at any education level for workers with matching political preferences. The marginal effect ranges from 0.703 for higher educated government workers to 0.773 for lower educated government workers. There are, however, substantial differences across education levels in the effect of becoming a government worker for workers whose political preferences do not match. The marginal effect for lower educated workers (0.316) and, in particular, higher educated workers (0.488) is much larger as compared to the marginal effect for intermediate educated workers (-0.044). As a result, the difference between matching and nonmatching workers is largest in the intermediate education category.

In the Netherlands the government in office usually consists of multiple political parties, also referred to as a coalition government. This implies that even when a worker's preferred political party (as measured by their vote) makes it into government, it is still possible that this party will form a coalition with political parties that are conflicting with a worker's preferences. Table 4.5 shows the average reported stance towards each political party for both government and nongovernment workers.[15] There are relatively small differences in reported stance between government and nongovernment workers. The most remarkable differences are found for the Socialist party and Freedom party. Government workers are significantly less positive about the Socialist party and Freedom party as compared to nongovernment workers.

[15] A worker's opinion of a political party is measured on a eleven-point scale using the question: "What do you think of [party name]?".

Table 4.5: Average reported stance towards individual political parties

Political party	Nongovernment employment	Government employment	Difference
Christian Democrats (CDA)	5.20	5.28	0.07
	(0.032)	(0.078)	
Labor party (PvdA)	5.33	5.45	0.12
	(0.031)	(0.082)	
Liberal party (VVD)	5.16	5.10	-0.06
	(0.032)	(0.080)	
Socialist party (SP)	5.36	5.06	-0.30***
	(0.033)	(0.082)	
Green party (GroenLinks)	5.30	5.34	0.04
	(0.035)	(0.086)	
Freedom party (PVV)	2.88	2.51	-0.36***
	(0.044)	(0.109)	
Social-Liberal party (D66)	5.44	5.59	0.15*
	(0.032)	(0.081)	
Christian Union party (CU)	4.48	4.53	0.05
	(0.035)	(0.089)	
Animal Welfare party (PvdD)	3.72	3.68	-0.04
	(0.039)	(0.098)	
Christian Reformed party (SGP)	3.33	3.27	-0.06
	(0.035)	(0.085)	

Notes: A worker's opinion is measured on a eleven-point scale by the question: "What do you think of [party name]?" Standard errors between parentheses. *, **, and *** indicate a significant difference in means at the .10, .05, and .01 levels, respectively.

Table 4.6 shows the results of the analysis using the information on a worker's stance towards each political party. Column 1 shows the effect of a worker's stance towards the largest coalition party on reported job satisfaction. Government workers who report a more positive stance towards the largest party in a coalition enjoy higher levels of job satisfaction as compared to workers with a less positive stance. The standardized marginal effect equals 0.122 and is marginally significant. Additionally, the estimation in column 2 shows that it is far more important whether a worker's stance towards all political parties in a coalition is positive. A worker's stance towards the entire coalition is measured by a worker's average rating of all individual coalition parties. Government workers with a more positive stance towards all coalition parties report significantly higher levels of job satisfaction as compared to government workers with a more negative stance. The marginal effect of a stan-

dard deviation increase in reported stance equals 0.162. A worker's stance towards coalition parties is unimportant for job satisfaction of workers in other sectors of the economy. As reported in column 3, these results are robust to weighting the political parties by their number of seats in parliament. The standardized marginal effect for government workers reduces slightly from 0.162 to 0.154 but remains highly significant.

Next, column 4 of Table 4.6 reports the results using information on the relative difference between a worker's reported stance towards coalition parties and opposition parties. The results are very much in line with the previous columns. Workers in the government sector who have a more positive stance towards the coalition parties as compared to the opposition parties enjoy significantly higher levels of job satisfaction than workers with a more positive stance towards the opposition parties as compared to the coalition parties. The marginal effect of a standard deviation increase for government workers equals 0.131 and is highly significant. Column 5 shows that these results are robust to weighting political parties by their number of seats in parliament. The standardized marginal effect increases slightly from 0.131 to 0.135. In summary, these results indicate that it is not only important whether a worker's first preference (as measured by their vote) matches to the political parties in office, but also what other parties have joined the coalition government after the election. A natural explanation is that, in the Netherlands, government policy is a result of intensive negotiations by coalition parties on the policy matters at hand. Therefore, political parties in office often have to compromise when making policy plans.

Table 4.6: Estimations using workers' opinions on all political parties

Dependent variable: job satisfaction	(1) Largest party	(2) All coalition parties	(3) All coalition parties weighted	(4) Coalition versus opposition parties	(5) Coalition versus opposition parties weighted
Government	0.201	0.027	0.039	0.518	0.509
	(0.371)	(0.344)	(0.345)	(0.363)	(0.360)
Positive stance	0.028	0.018	0.017	0.017	0.017
	(0.028)	(0.025)	(0.025)	(0.023)	(0.023)
Government × Positive stance	0.094	0.144**	0.137**	0.114**	0.118**
	(0.074)	(0.060)	(0.060)	(0.053)	(0.051)
Control variables	Yes	Yes	Yes	Yes	Yes
Individual fixed effects	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	5469	5217	5217	4540	4540
Individuals	1841	1780	1780	1574	1574
Log likelihood	-6355	-6073	-6074	-5276	-5275

Notes: Standard errors between parentheses are clustered at the individual level. Positive stance refers to: the largest party in column (1), the average of coalition parties in column (2), the average of coalition parties weighted by the number of seats in parliament in column (3), the difference between coalition parties and opposition parties in column (4), and the difference between coalition parties and opposition parties weighted by the number of seats in parliament in column (5). The variable positive stance is standardized in each column for comparison purposes. *, **, and *** indicate significance based on a two sided test at the .10, .05, and .01 levels, respectively.

4.5 Concluding remarks

This chapter has studied how matching mission preferences affect job satisfaction of government workers using a sample of Dutch workers. Results show that government workers are more satisfied with their job when their mission preferences (as measured by their reported vote in parliamentary elections) match those of the political parties in office as compared to when their preferences do not match. This result is particularly strong for intermediate educated workers. Matching mission preferences do not affect job satisfaction of workers employed outside the government sector. My results additionally show that government workers report higher job satisfaction as compared to nongovernment workers. This difference is partly explained by matching mission preferences. Only those workers whose mission preferences match those of the political parties in office are significantly more satisfied when employed in the government sector. Finally, it is not only important whether a worker's preferred party (as measured by their vote) takes up office, but also how a worker rates all of the other coalition parties that have taken up office. Workers with a more positive stance towards all coalition parties are significantly more satisfied with their job as compared to workers with a more negative stance.

An interesting addition to this study would be to examine how matching mission preferences relate to sorting. Theory predicts that workers sort to organizations they share a mission with (Besley and Ghatak 2005, Dur and Zoutenbier 2014). This leads to two interesting implications. First, employee turnover should be higher following election years with a change in government as compared to years without a change in government. As a change in government (and therefore mission) would create an exogenous shock to workers' mission motivation. Second, one would expect an inflow of workers whose mission preferences match those of the government, while the outflow of workers should consist largely of workers whose mission preferences conflict with the mission of the government. Unfortunately it is not possible to shed light on these issues using the LISS data.

4.A Appendix

Table 4.A: Results of the ordered fixed effects estimation on job satisfaction

Dependent variable: job satisfaction			
	(1)	(2)	(3)
Government	1.195**	0.772	0.793
	(0.536)	(0.508)	(0.536)
Match	0.011	-0.102	-0.073
	(0.114)	(0.119)	(0.118)
Government × Match		0.820**	0.810**
		(0.349)	(0.357)
Control variables	No	No	Yes
Individual fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes
Log likelihood	-2523	-2517	-2455

Notes: The method used in estimation is the 'blow-up and cluster' method as described by Baetschmann et al. (2011). Standard errors between parentheses are clustered at the individual level. *, **, and *** indicate significance based on a two sided test at the .10, .05, and .01 levels, respectively.

Chapter 5

The Effect of Student Feedback to Teachers: Evidence from a Field Experiment

Joint with Margaretha Buurman, Josse Delfgaauw and Robert Dur

5.1 Introduction

Regular provision of performance feedback to employees is common practice in many organizations. Feedback often serves as a means to provide recognition to good performers as well as to help employees learn about how to improve one's performance. Several recent studies have investigated the effect of receiving feedback on performance. In a variety of organizations, these studies have shown that the provision of feedback can have sizeable positive effects on performance (Azmat and Iriberri 2010, 2014, Blanes i Vidal and Nossol 2011, Kuhnen and Tymula 2012, Tran and Zeckhauser 2012, Delfgaauw et al. 2013, Gerhards and Siemer 2014). Barankay (2012) and Bandiera et al. (2013) find that feedback may also have an adverse effect.

Providing employees with feedback on their performance has also become increasingly popular in education. Many schools use students' evaluations of teachers to enable and motivate teachers to improve teaching. Moreover, evaluations sometimes play a role in tenure, bonus, and promotion decisions (Watts and Becker,

1999). There is an extensive literature that studies the use of students' evaluations in teaching (see for instance Cohen 1980 and Marsh 2007 for overviews of the literature). In general, studies find positive but small effects of students' feedback on the performance of teachers.

This chapter studies the effect of students' feedback on the performance of teachers by conducting a field experiment at a large Dutch school for intermediate vocational education. Students were asked to evaluate their teachers using a questionnaire consisting of 19 items. We implemented a feedback treatment where a randomly chosen group of teachers received the outcomes of their students' evaluations. The other group of teachers was evaluated as well but did not receive any personal feedback. We estimate the effect of receiving feedback on teachers' performance by examining students' evaluations of teachers a year later.[1] In contrast to most previous studies (Centra, 1973, being the main exception), we also investigate whether the effect of feedback depends on how student evaluations differ from the teacher's own performance assessment on the same items. For that purpose, we collect data on teachers' self-assessed performance both before and after the experiment. Another difference with most previous studies is that we examine the effect of feedback over a much longer period of time, namely a full year. Most earlier studies are restricted to studying the effects of feedback within a semester.

The results of our experiment show that receiving feedback has no effect on feedback scores of teachers a year later. We find a precisely estimated zero average treatment effect of 0.04 on a five-point scale with a standard error of 0.05. Our results differ somewhat from the findings of the existing studies mentioned above. A possible explanation for the lack of a treatment effect in our study may be that we investigate the effect of feedback in the long run. Feedback may affect short-run performance, but the effect may fade away in the long run, as in Azmat et al. (2014) in the context of providing relative performance information to students.

[1] There are no standardized test scores or other objective measures of student performance available. Hence, we cannot examine whether providing feedback affects students' performance and/or teachers' value-added. Carrell and West (2010) and Braga et al. (2014) present evidence that student evaluation scores are negatively correlated with teachers' value-added. It is important to stress that these findings need not imply that improvements in student evaluations caused by teachers' response to students' feedback lead to a worsening of student performance.

Next, we study whether the content of the feedback matters for the effect of receiving feedback on performance. For that purpose, we compare the received student feedback with the teacher's prior self-assessment of performance on the same items. This allows us to uncover whether a teacher actually learns something new from the received feedback. We find no effect of the feedback treatment for teachers who evaluate themselves similarly to the students' evaluation. The estimate of the treatment effect for these teachers is very close to zero. We do find a significant positive treatment effect for teachers who learn that their own assessment is much more favorable than their students' evaluation.

Our findings are well in line with Centra (1973), the only prior study – to our knowledge – investigating whether teachers' response to student evaluations depends on the discrepancy between teachers' self-assessment and their students' evaluations. Among a sample of about 350 teachers at 5 different colleges in the US, he finds on average little effect of mid-semester feedback on end-of-semester student ratings. However, among teachers for whom students' mid-semester ratings fell short of their own assessment, end-of-semester ratings increased more strongly in the difference between the teacher's and students' mid-semester ratings for teachers who received mid-semester feedback as compared to teachers who did not receive feedback. Our study finds, in a different population, similar results that hold over the period of a full year.

How a teacher's performance compares to the performance of her colleagues may also matter for the effect of receiving feedback. In our experiment, all teachers – both in treatment and control– were informed about the average of the evaluation outcomes of the teachers in their team. This implies that some teachers in the treatment group learn that they perform better than their direct co-workers, while others learn that they perform worse. Relative performance information may matter for the performance of teachers when they care about their status (Moldovanu et al. 2007, Besley and Ghatak 2008, Auriol and Renault 2008) or when teachers want to conform to social norms (Bernheim 1994, Sliwka 2007). Our results show that the treatment effect is very close to zero for teachers who perform better than their team and for teachers who perform a lot worse than their team. We do find a small

positive (but only marginally significant) effect of feedback for workers who perform only slightly worse than their team.

An additional response of teachers to receiving student evaluations that conflict with their self-assessment is to adjust their self-assessment. We find only small effects of the feedback treatment on the self-assessment of teachers. Teachers who learn that their students' evaluations are on average better than their self-assessment do not update their self-assessment. Teachers who learn that their students' evaluations are worse than their self-assessment do lower their self-assessment of performance, but only to a limited extent.

Finally, we investigate whether receiving feedback and the content of the feedback have an effect on teachers' job satisfaction. Receiving information about performance might affect teachers' job satisfaction when teachers intrinsically care about their performance (as in, e.g., Besley and Ghatak 2005 and Delfgaauw and Dur 2008) or when they enjoy being perceived as a competent or dedicated teacher (Suurmond et al. 2004, Benabou and Tirole 2006). In either case we would expect that job satisfaction of teachers in the treatment group increases with the difference between student feedback and teacher's self-assessment. Earlier work by Ryan et al. (1980) shows that the introduction of students' evaluations negatively affects job satisfaction on average. Our results show that providing teachers with feedback on their performance has no significant effect on their job satisfaction. We find a similar result when we look at the effect of the content of feedback.

We proceed as follows. The next section provides a detailed description of the field experiment. Section 5.3 reports the descriptive statistics of the sample. In section 5.4 we describe our empirical strategy. The results of the field experiment are presented in section 5.5. Finally, section 5.6 concludes.

5.2 Experimental design

5.2.1 Background

The field experiment took place at a Dutch school for intermediate vocational education between the end of 2011 and the beginning of 2013. The school offers education to teenagers (usually in the age range from 16 to 20) and (young) adults. The offered curricula prepare for a large number of occupations, including technical professions, administrative jobs, maritime professions, and jobs in information technology, health care, and the hospitality sector. In all fields, there are multiple programs that differ by level and duration. The durations of programs vary between one and four years.

All teachers are assigned to teams that are supervised by a manager. The teams are organized around educational fields. Each team consists of roughly 10 to 20 teachers. Teachers teach one or several courses to a number of different classes of students. Teachers of general subjects (such as language or math) typically teach in multiple fields, while most teachers of field-specific courses (such as cooking or inland shipping) only teach students within their own field. Depending on the field of education, the average class size is 10 to 30 students. Students can have the same teacher for different courses in their program.

In 2011, the school had almost 8,000 students and about 470 teachers divided over 27 teams. The school merged in 2012 with another intermediate vocational education school, which increased the number of students to about 9,500 and the number of teachers to about 550. In 2013, the school had 9,000 students and 520 teachers. The merger did not interfere with our experiment, in that the organizational structure as well as the composition of the teams in the experiment remained largely unchanged. However, the merger did result in a higher attrition of teachers, which we shall analyze in depth in the next section.

The teachers in the experiment had not received individual feedback from student evaluations at this school in the past. During the experiment, no other individual feedback based on student evaluations was provided to the teachers. The school does participate in a national survey on student satisfaction, which provides information about the student evaluations of the school and of educational fields. Fur-

thermore, most teachers have annual performance interviews with their manager. Finally, in 2011 teachers participated in a 360 degree evaluation, which included feedback from their manager, colleagues, and external clients (such as companies that provide internships), but not from students. None of these alternative types of feedback differed between teachers in the treatment group and the control group in our experiment.

Teachers at this school earn a flat wage. The school originally intended to follow up on this feedback experiment with another, government-funded experiment aimed at testing the effects of individual incentive pay for teachers, partially based on student evaluation scores. However, this plan was abandoned in May 2012 due to central government budget cuts. The school did continue the yearly student evaluations after the experiment ended.

5.2.2 Set-up of the experiment

The experiment is based on two waves of student evaluations of teachers. The first wave took place at the end of 2011, the second wave at the end of 2012. In a pilot prior to 2011, six teams had implemented student evaluation surveys that consisted of 19 items. After analyzing the outcomes of these surveys, we used an adjusted version of this questionnaire in our study. The six pilot-teams are not part of our experiment, which took place among the remaining 21 teams. The final version of the questionnaire can be found in Appendix 5.A. It consists of 19 statements, to which students could respond on a five-point scale ranging from 'disagree' to 'agree',[2] as well as a space for comments and recommendations. The questionnaire includes statements on teacher quality, organizational aspects, and interpersonal skills.

In both years, the questionnaires were administered at the end of the first teaching period in the school year. Before the start of the school year, teachers were informed through an information bulletin that student evaluations would take place. Further, in 2011, teachers were informed that a random half of the teachers would

[2] In addition, students could respond "Do not know / not applicable" to a statement. Throughout the analysis, we treat such responses as missing observations. Alternatively, we could drop questionnaires with partial nonresponse altogether. This reduces the sample size to quite some extent, but does not affect any of our main conclusions.

receive their evaluation scores, so as to enable us to evaluate the effects of feedback provision. Exactly which teachers would receive their scores was determined later on, through a randomization procedure described below. In 2012, teachers were informed that all of them would receive their scores this time.[3]

The completion of the survey by students took place during class hours, in a separate classroom under the supervision of (preferably) a person who was not evaluated by that class of students. It was decided that students would evaluate about three teachers. Asking students to evaluate many more teachers was deemed undesirable, as students might lose interest after filling out several questionnaires. The team managers decided which teachers would be evaluated by a particular class of students. In the data, the number of teachers evaluated by a student ranges from 1 to 5. Nearly all teachers in the 21 teams were evaluated by students. All teachers were asked to complete a self-assessment questionnaire on the same items as contained in the student evaluation questionnaire.[4]

After the first wave of evaluations had taken place, we randomly assigned teachers to treatment and control. Within each team, we stratified the assignment by average student evaluation score and by the difference between teachers' average self-assessment score and average student evaluation score, in the following way. Within each team, we ranked teachers by their average score (over all students that evaluated them) on all 19 statements except statements 14 and 15.[5] Based on this ranking, we create three equally large strata. Within these strata, we ranked all teachers based on the difference between their average self-assessment scores and their average student evaluation score, both based on the same 17 items. Using this

[3]Our experiment thus yields an estimate of the effect of feedback provision on subsequent performance. Our design does not enable us to assess the effect of the anticipation of feedback provision (as all teachers anticipated that they might receive feedback), nor can we assess the possible effects of performance measurement (because all teachers knew that their performance would be measured).

[4]In contrast to the student evaluation form, the questionnaire for teachers did not contain "Do not know / not applicable" as a possible answer category. Only 5 teachers refrained from answering one or more items. We excluded these teachers from the sample.

[5]We excluded statements 14 and 15 here because these consider factual statements regarding time taking for answering e-mails and grading (see Appendix 5.A). We expected that on these items, students' answers were unlikely to surprise teachers. On the other 17 items, students' experience may differ from the teacher's perception and, hence, these are more likely to contain novel information for the teacher.

ranking, we alternated the assignment of teachers to treatment and control, using a random device to determine whether the teachers in odd positions or the teachers in even positions are placed in the treatment group.[6] This procedure helps to create balance between the treatment group and the control group in terms of average student evaluation score as well as in terms of the gap between student evaluation scores and self-assessment. Moreover, we obtain balance across teams.

The teachers in the treatment group received their feedback in Spring 2012. It contained the average student evaluation score on each of the 19 items, both over all evaluations as well as split out by class. It also contained the average evaluation score over all items, again averaged over all evaluations as well as by class. Furthermore, it included the teacher's self-assessment scores, on all items as well as the overall average. Lastly, it contained the average student evaluation score of all teachers in the teacher's team, on all 19 items as well as the overall average. Note that in the team scores, the student evaluations of teachers in the control groups are included. The team managers also received this feedback of the teachers in the treatment group (but not of the teachers in the control group). The teachers in the control groups did not receive their individual student evaluation scores, but they did receive their self-assessment scores as well as the team scores.

To study the effect of receiving feedback, our main performance measure is average student evaluations one year later. Unfortunately, there are no 'objective' performance measures available. During the period of our experiment, there were no standardized tests at this school. Moreover, as students had about half of their teachers who did and the other half of their teachers who did not receive feedback, we cannot use passing rates, drop-out rates, or grade averages as performance measures.

At the end of 2012, we conducted another wave of student evaluations, using the same questionnaire and the same procedure. This time, all teachers were informed that they would receive their 2012 student evaluation scores, which happened in Spring 2013. Furthermore, all teachers were asked to complete the self-assessment questionnaire again. This allows us to study whether teachers' self-assessments respond to students' feedback.

[6] Teachers who did not complete the self-assessment were randomly assigned to treatment and control within their stratum.

Lastly, to examine the effect of feedback on teachers' job satisfaction, we use data from an employee satisfaction survey that was conducted independently of this experiment at the end of 2012. We measure a teacher's job satisfaction by her answer to the statement: "I am satisfied with working at [school name]". Respondents had to pick one answer on a five-point scale ranging from "not at all satisfied" to "fully satisfied".[7]

5.3 Data description

In the first wave of student evaluations, 323 teachers are evaluated. These teachers are randomly assigned to the treatment or the control group, in the manner described above. In the second wave of student evaluations, 242 out of these 323 teachers are again evaluated. Hence, 81 teachers drop out of our sample between the first and second wave of student evaluations. Our estimations are based on the remaining 242 teachers, of whom 116 teachers have been assigned to the treatment group, while the remaining 126 teachers are in the control group. Over the two waves, we have a total of 15,194 student evaluation scores for these teachers. There are some outliers in the data, but 95% of all teachers in the analysis are evaluated between 10 to 55 times per wave. The number of evaluations per teacher may differ due to differences in class size or differences in response rates across classes. Below, we first provide descriptive statistics for the 242 teachers in the analysis and subsequently discuss attrition.

Table 5.1 reports descriptive statistics for the teachers in our analysis. In the first wave, teachers are on average evaluated by about 33 students. The average evaluation score of a teacher in 2011 is 4.12 on a five-point scale. The average evaluation score in 2011 hardly differs between teachers in the treatment group and teachers in the control group. The difference is 0.05 and statistically insignificant. On average, teachers' self-assessment score is 4.60, which is considerably higher

[7] The job satisfaction question is part of the organization's employee satisfaction survey that is conducted on a yearly basis. Unfortunately, both the wording of the job satisfaction question as well as the answer scales differ between the year before and the year after we provided feedback to a random subset of the teachers. As a result, it is difficult to compare job satisfaction before receiving feedback to job satisfaction after receiving feedback.

than the evaluations by their students. There is no significant difference in teachers' self-evaluations between the treatment group and the control group. On observable characteristics, teachers in the treatment and the control groups are also comparable. Teachers in the treatment group are slightly less likely to be female, are a bit younger, have shorter tenure, and work less hours on average. Only the differences in working hours and tenure are marginally significant at the 10-percent level.

Table 5.1: Descriptive statistics of teachers

	Treatment group	Control group	All teachers
First wave evaluation by students			
Mean	4.15	4.10	4.12
Standard deviation	(0.46)	(0.49)	(0.48)
First wave number of evaluations by students			
Mean	32.27	33.40	32.86
Standard deviation	(12.65)	(14.97)	(13.89)
First wave self-evaluation[a]			
Mean	4.62	4.59	4.60
Standard deviation	(0.29)	(0.30)	(0.29)
Gender: % female			
Mean	0.46	0.49	0.48
Standard deviation	(0.50)	(0.50)	(0.50)
Age: years			
Mean	47.25	49.22	48.26
Standard deviation	(10.26)	(9.97)	(10.14)
Employment: % of fte			
Mean	0.76	0.81	0.78*
Standard deviation	(0.23)	(0.20)	(0.21)
Tenure: years			
Mean	14.10	16.42	15.28*
Standard deviation	(10.42)	(10.01)	(10.26)
Number of teachers	116	126	242

Notes: [a]The self-evaluation was completed by 166 teachers in our sample, 82 in the treatment group and 84 in the control group. *, **, and *** indicate a statistically significant difference between the treatment group and control group at the .10, .05, and .01 level, respectively.

Figure 5.1 shows the average student evaluation score in the treatment group and the control group for both years. For both groups, the average evaluation score in the first year is slightly higher than the average score in the second year. This reduction in evaluation scores is slightly smaller for teachers in the treatment group. Figures 5.2 and 5.3 show the distribution of the student evaluation scores in the treatment group and the control group, for the first and second year, respectively. Figure 5.2 shows that our stratified randomization was successful in balancing teachers' 2011 average student evaluation scores between the treatment group and the control group. The distributions of the 2012 average evaluation scores do not markedly differ from their 2011 counterparts.

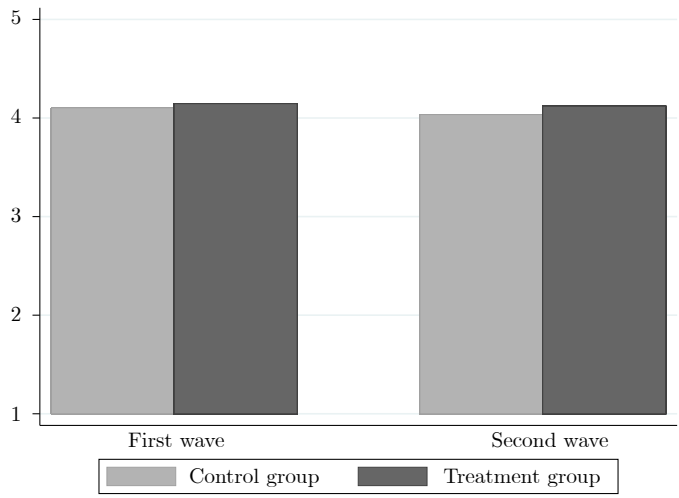

Figure 5.1: Average student evaluation scores by year

Notes: A student's evaluation of a teacher is defined as the average score on 19 statements on the teacher's performance (see Appendix 5.A). The answer categories for each statement are [1] Disagree, [2] Disagree somewhat, [3] Disagree somewhat/agree somewhat, [4] Agree somewhat, and [5] Agree.

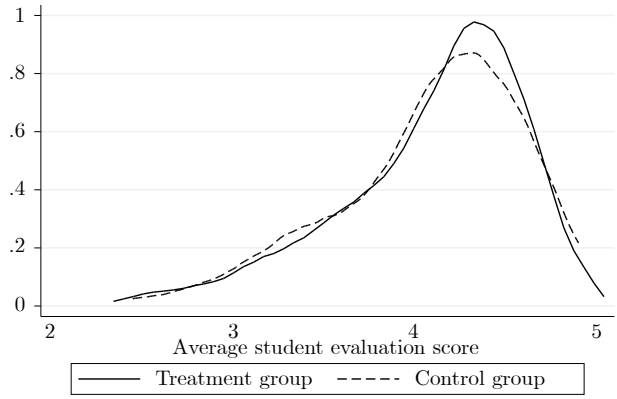

Figure 5.2: Distribution of student evaluations in the first wave

Notes: Distribution estimated using a kernel density function. A student's evaluation of a teacher is defined as the average score on 19 statements on the teacher's performance (see Appendix 5.A). The answer categories for each statement are [1] Disagree, [2] Disagree somewhat, [3] Disagree somewhat/agree somewhat, [4] Agree somewhat, and [5] Agree.

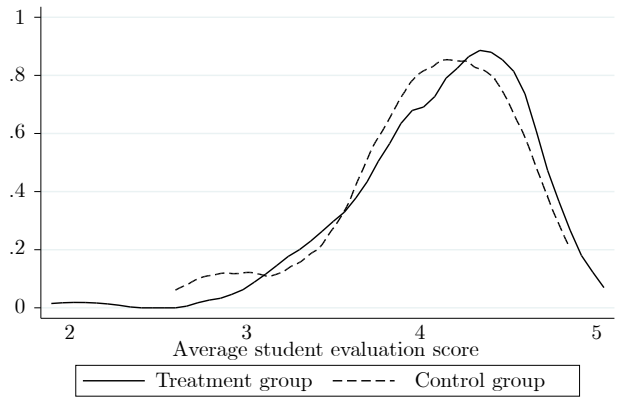

Figure 5.3: Distribution of student evaluations in the second wave

Notes: Distribution estimated using a kernel density function. A student's evaluation of a teacher is defined as the average score on 19 statements on the teacher's performance (see Appendix 5.A). The answer categories for each statement are [1] Disagree, [2] Disagree somewhat, [3] Disagree somewhat/agree somewhat, [4] Agree somewhat, and [5] Agree.

Table 5.2 compares the teachers in our sample with the 81 teachers who drop out of the sample after the first wave of student evaluations.[8] Attrition is balanced between the treatment and control group: 38 teachers (24.7%) drop out of the treatment group and 43 teachers (25.4%) drop out of the control group. Teachers who drop out of the sample receive lower student evaluations in the first wave as compared to teachers who remain in the sample. The difference is 0.11 points and statistically insignificant. The average self-assessment score is significantly lower among teachers who drop out as compared to the teachers in our sample. Furthermore, teachers who leave the sample are significantly older and have longer tenure, suggesting that retirement is partially responsible for attrition. The final two columns in Table 5.2 split the group of teachers who drop out by their assignment to the treatment group and the control group. Teachers who were assigned to the treatment group receive slightly worse student evaluation scores, evaluate themselves higher, and have longer tenure as compared to teachers assigned to the control group. However, none of these differences is statistically significant.[9]

Not all teachers in our sample completed the self-assessment questionnaire. Among the 242 teachers in our analysis, 166 teachers performed the self-assessment in the first year and 132 teachers did so in both years. Table 5.3 compares the teachers who completed the self-assessment survey twice with the teachers who did so only once or never. Most importantly, there is no significant difference between the treatment and control group in the number of times a teacher completes the self-evaluation. Furthermore, we find no difference in first-wave self-evaluation scores between teachers who did and did not complete the second self-evaluation. We do find that teachers who completed both self-evaluations receive significantly higher student evaluation scores in the first wave. On observables, males are relatively likely to refrain from completing the first self-evaluation.

[8] A large fraction of these 81 teachers left the school, in part as a result of a severance pay package offered to employees after the merger.

[9] We further examine the issue of selective attrition in section 5.5.

Table 5.2: Attrition

	Sample	Total Attrition	Attrition	
			Treatment	Control
First wave evaluation by students				
Mean	4.12	4.02	3.98	4.06
Standard deviation	(0.48)	(0.56)	(0.58)	(0.56)
First wave number of evaluations by students				
Mean	32.27	28.15**	27.34	28.86
Standard deviation	(12.65)	(15.58)	(14.71)	(16.46)
First wave self-evaluation[a]				
Mean	4.60	4.41***	4.51	4.36
Standard deviation	(0.29)	(0.68)	(0.35)	(0.81)
Gender: % female				
Mean	0.48	0.47	0.48	0.46
Standard deviation	(0.50)	(0.50)	(0.51)	(0.51)
Age: years				
Mean	48.26	50.95*	50.96	50.95
Standard deviation	(10.14)	(9.75)	(8.65)	(10.50)
Employment: % of fte				
Mean	0.78	0.76	0.74	0.77
Standard deviation	(0.21)	(0.23)	(0.20)	(0.25)
Tenure: years				
Mean	15.28	18.15*	16.58	19.17
Standard deviation	(10.26)	(10.16)	(9.90)	(10.37)
Number of teachers	242	81	38	43

Notes: [a]The self-evaluation was completed by 166 teachers in our sample and by 46 teachers who dropped out, of whom 29 had been assigned to the treatment group and 17 to the control group. *, **, and *** indicate a statistically significant difference between the sample group and attrition group at the .10, .05, and .01 level, respectively. Within the group of teachers who drop out, none of the differences between teachers assigned to the treatment group and teachers assigned to the control group are statistically signficant.

Table 5.3: Descriptive statistics by self-evaluation

	Both self-evaluations completed	Only first self-evaluation completed	No self-evaluation completed
Assigned to treatment group			
Mean	0.49	0.50	0.45
Standard deviation	(0.50)	(0.51)	(0.50)
First wave evaluation by students			
Mean	4.21	4.05	4.00***
Standard deviation	(0.41)	(0.49)	(0.55)
First wave number of evaluations by students			
Mean	32.20	33.41	33.74
Standard deviation	(13.05)	(12.49)	(15.88)
First wave self-evaluation			
Mean	4.60	4.61	
Standard deviation	(0.30)	(0.27)	
Gender: % female			
Mean	0.50	0.61	0.37*
Standard deviation	(0.50)	(0.50)	(0.49)
Age: years			
Mean	48.23	46.88	48.94
Standard deviation	(9.91)	(11.21)	(10.12)
Employment: % of fte			
Mean	0.82	0.69	0.77***
Standard deviation	(0.19)	(0.24)	(0.22)
Tenure: years			
Mean	15.42	15.53	14.89
Standard deviation	(9.97)	(11.35)	(10.41)
Number of teachers	132	34	76

Notes: *, **, and *** indicate a statistically significant difference between the groups at the .10, .05, and .01 level, respectively (based on an F-test).

5.4 Empirical strategy

We estimate the effect of receiving feedback using OLS with time and teacher fixed effects. The dependent variable, denoted by y_{it}, is the average student evaluation score of teacher i at time $t \in \{1, 2\}$. This is given by the mean score on the 19 items on the evaluation questionnaire (see Appendix 5.A) averaged over all students that evaluate a teacher in a given year.[10] The main variable of interest is T_{it}, which is a dummy variable that equals one in the second year when teacher i is part of the treatment group and zero otherwise. Furthermore, we include a time fixed effect and teacher fixed effects, denoted by λ_t and θ_i, respectively. The regression equation reads:

$$y_{it} = \gamma T_{it} + \lambda_t + \theta_i + \varepsilon_{it}. \tag{5.1}$$

The estimated average treatment effect of receiving feedback is given by γ. In all our estimations, we cluster standard errors at the teacher level.[11]

Next, we investigate how the effect of receiving feedback depends on the content of the feedback. First, we include the interaction between the treatment dummy and the variable $\triangle self_i$, which denotes the difference between teacher i's average self-assessment score in the first year and teacher i's average student evaluation score in the first year. Hence, $\triangle self_i$ gives the extent to which teacher i overestimates or underestimates her performance as compared to her students' assessment. We analyze this interaction effect by estimating:

$$y_{it} = \gamma T_{it} + \varphi \left(T_{it} \times \triangle self_i\right) + \psi \left(E_t \times \triangle self_i\right) + \lambda_t + \theta_i + \varepsilon_{it}. \tag{5.2}$$

Note that we also interact $\triangle self_i$ with dummy variable E_t that takes value one in the second year of our experiment and is zero otherwise. This interaction accounts for correlations between second-year evaluation scores and $\triangle self_i$ that are independent of whether the teacher received her first-year evaluation scores, for instance due to reversion to the mean.

[10] Using instead the average score excluding statements 14 and 15 (as used to stratify assignment to treatment) does not affect our results in any important way.

[11] Equation (5.1) is specified at the teacher level. We also estimate the average treatment effect at the student level.

Second, in a similar way we include the interaction between the treatment dummy and the variable $\triangle team_i$, which gives the difference between teacher i's average student evaluation score in the first year and the average of the first-year evaluations of all teachers in her team. Hence, $\triangle team_i$ denotes whether teacher i performs better or worse than her colleagues, on average.

Lastly, we estimate similar regressions using teachers' average self-assessment scores and teachers' job satisfaction as dependent variables.

5.5 Results

The estimates of the average treatment effect of receiving feedback on subsequent student evaluation scores are given in Table 5.4. The first column gives the results of estimating equation (5.1). The estimated average treatment effect on the average student evaluation score is 0.043, which is both economically and statistically insignificant. This effect is quite precisely estimated, with a standard error equal to 0.054 and a 95 percent confidence interval that runs from -0.063 to 0.149. This result is in contrast to most previous studies on the provision of feedback as discussed in section 5.1, which usually find a positive effect of feedback on performance. A possible explanation for this difference may be that previous studies focus on the effect of feedback in the short run, whereas we study the effect of feedback over the period of a full year. This interpretation is consistent with Azmat et al. (2014) who find that students respond to relative performance information in the short run, but not in the long run (where the long run in their paper is a full year, as in ours).

The second column of Table 5.4 shows the average treatment effect estimated at the student level. Here, the dependent variable is the average evaluation score of a teacher by individual students. Again, the estimated average treatment effect is small and statistically insignificant. The difference between the two estimates indicates that the average treatment effect is slightly higher for teachers who are evaluated by relatively few students.[12] In the remainder of this chapter, we only

[12] In the estimation at the teacher level, all teachers are weighted equally, independent of the number of students that evaluate them. In contrast, teachers who are evaluated by many students receive a higher weight in the estimation at the student level, relative to teachers who are evaluated

Table 5.4: Effect of feedback on teachers' performance

Dependent variable: average student evaluation	(1) Teacher level	(2) Student level
Treatment	0.043	0.021
	(0.054)	(0.046)
Year fixed effect	Yes	Yes
Teacher fixed effects	Yes	Yes
Observations	484	15194
Teachers	242	242
Within R^2	0.016	0.000

Notes: Standard errors clustered at the teacher level between parentheses. *, **, and *** indicate significance based on a two-sided test at the .10, .05, and .01 level, respectively

report the estimates at the teacher level; the estimated effects at the student level are qualitatively similar.[13]

Next, we consider possible heterogeneity in treatment effects depending on the content of the feedback. First, we investigate whether the effect of feedback depends on the gap between teachers self-assessment scores and the evaluation scores they receive from their students. Column 1 of Table 5.5 gives the results of estimating equation (5.2). The interaction effect is positive but insignificant. The estimated treatment effect for teachers who learn that their first-period self-assessment is equal to their students' assessment is very close to zero at 0.014. For teachers who learn that they overestimate their performance by one point, the treatment effect is 0.104 higher. In column 2, we add a quadratic interaction between the treatment dummy and the difference between teachers' first-period self-assessment score and their students' evaluation scores. Figure 5.4 depicts the estimated effects of receiving feedback. We find that teachers whose own assessment corresponds to students' assessment do not respond to receiving feedback. The treatment effect is positive for teachers who learn that they highly underestimate or, in particular, highly over-

by few students. Estimating the average treatment effect at the teacher level while weighing teachers by the number of students evaluating them in either the first or second wave gives results close to those reported in column 2 of Table 5.4.

[13] Additionally, we have also estimated the average treatment effect on each of the 19 items of the questionaire separately. Estimated effects range from 0.00 to 0.11, and is significant (at the 0.06 level) only for item 5 ("The teacher is able to explain the connection to the real world.").

Table 5.5: Heterogenous treatment effects of feedback on performance

Dependent variable: average student evaluation	(1)	(2)	(3)	(4)
Treatment	0.014	-0.005	0.062	0.087
	(0.066)	(0.062)	(0.048)	(0.058)
Δself $\times$ treatment	0.104	-0.031		
	(0.110)	(0.113)		
Δself^2 $\times$ treatment		0.146		
		(0.101)		
Δteam $\times$ treatment			-0.090	-0.127
			(0.101)	(0.112)
Δteam^2 $\times$ treatment				-0.115
				(0.164)
Δself $\times$ second period	0.216**	0.044		
	(0.087)	(0.078)		
Δself^2 $\times$ second period		0.185**		
		(0.076)		
Δteam $\times$ second period			-0.369***	-0.353***
			(0.075)	(0.076)
Δteam^2 $\times$ second period				0.058
				(0.129)
Year fixed effect	Yes	Yes	Yes	Yes
Teacher fixed effects	Yes	Yes	Yes	Yes
Observations	332	332	484	484
Teachers	166	166	242	242
Within R^2	0.166	0.249	0.217	0.219

Notes: Standard errors clustered at the teacher level between parentheses. *, **, and *** indicate significance based on a two-sided test at the .10, .05, and .01 level, respectively. The variable $\Delta self$ indicates the difference between a teacher's first-period average self-assessment score and her average first-period student evaluation score. The variable $\Delta team$ indicates the difference between a teacher's first-period average student evaluation score and average of all first-period average student evaluation scores of the teachers in her team.

estimate their performance. This effect is significant at the 10-percent level for teachers who overestimate their performance by more than one point. However, the fraction of teachers in this interval is fairly small, about ten percent (as can be seen from light grey kernel density in Figure 5.4).[14]

[14]We also examined whether treatment effects differ by first-period student evaluation score. To do so, we ran a regression similar to (5.2), but with the first-period student evaluation score instead of $\triangle self_i$. We find that the treatment effect is very close to zero and negatively but not significantly related to first-period student evaluation score. Including both first-period student evaluation score and $\triangle self_i$ in one single regression gives rise to problems of multicollinearity.

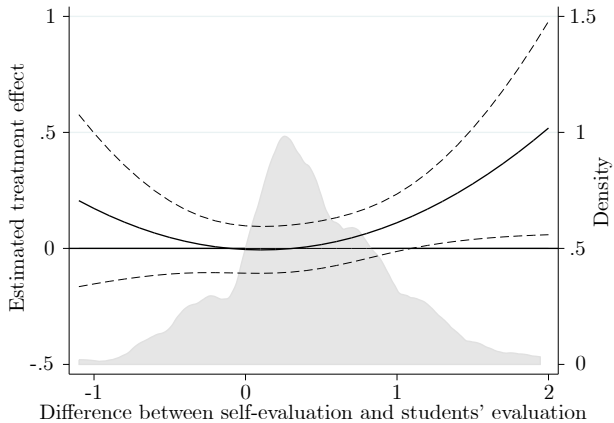

Figure 5.4: Estimated effect of feedback by the difference between a teacher's self-evaluation score and her student evaluation score

Notes: This figure shows the estimated treatment effect given the difference between a teacher's first-period average self-assessment score and her average first-period student evaluation score ($\Delta self_i$). Dashed lines show the 90% confidence interval. The transparent grey area shows a kernel density of the observations.

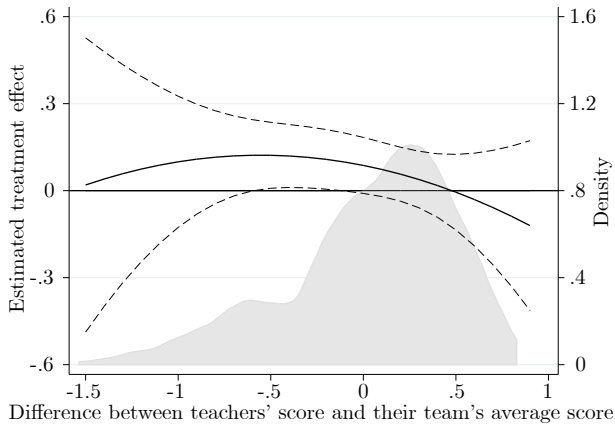

Figure 5.5: Estimated effect of feedback by the difference between a teacher's own student evaluation score in the first wave and her team's average score

Notes: This figure shows the estimated treatment effect given the difference between a teacher's first-wave average student evaluation score and average of all first-wave average student evaluation scores of the teachers in her team ($\Delta team_i$). Dashed lines show the 90% confidence interval. The transparent grey area shows a kernel density of the observations.

Second, we examine whether the effect of feedback depends on the gap between a teacher's first-period student evaluation score and the average score in his team. The third column of Table 5.5 gives the results of estimating equation (5.2) with $\triangle team_i$ instead of $\triangle self_i$. We find that the estimated interaction effect is negative and statistically insignificant. The estimated treatment effect for teachers who learn that they perform as well as their team (on average) is 0.062. For teachers who learn that their student evaluation score is one point above the average of their colleagues, this effect is reduced by 0.090 points. In column 4, we add a quadratic interaction between the treatment dummy and the difference between a teacher's first-period average student evaluation score and her team's average score. As illustrated in Figure 5.5, the estimated treatment effect is close to zero for teachers who learn that they perform better than their team and for teachers who learn that they perform considerably worse than their team. However, the treatment effect is positive and marginally significant (at the 10-percent level) for teachers who learn that they score only slightly worse than their colleagues (up to 0.5 points below their teams' average). A possible explanation is that teachers dislike scoring below average. Teachers who learn that they score slightly below average may feel that it is possible to catch up and increase their efforts. A teacher who learns that she performs considerably worse than her colleagues might feel discouraged from trying to catch up.

As discussed before, 81 teachers who were evaluated in 2011 and assigned to either the treatment group or control group were not evaluated in 2012 and, hence, are not included in the analysis. If attrition is related to the content of the feedback received, the teachers who drop out of the treatment group may differ from the teachers who drop out of the control group, which could bias our results. To examine whether attrition is related to the content of the feedback received, we perform probit estimations on the set of teachers with student evaluation scores in 2011, with a dummy that takes value one if a teacher drops out as a dependent variable. As reported in Table 5.A in the Appendix, the estimations show that neither receiving feedback nor the content of this feedback significantly affects the probability of dropping out.[15]

[15]These results are robust to not including individual controls. Since we miss data on one or more individual characteristics for 41 teachers, the sample size then increases to 323.

Table 5.6: Effect of feedback on the self-evaluation by teachers

Dependent variable: average self-evaluation	(1)	(2)	(3)
Treatment	-0.067	-0.042	-0.065
	(0.046)	(0.059)	(0.057)
Δself $\times$ treatment		-0.108	-0.075
		(0.097)	(0.117)
Δself^2 $\times$ treatment			0.031
			(0.109)
Δself $\times$ second period		-0.091	-0.222***
		(0.060)	(0.059)
Δself^2 $\times$ second period			0.136***
			(0.037)
Year fixed effect	Yes	Yes	Yes
Teacher fixed effects	Yes	Yes	Yes
Observations	264	264	264
Teachers	132	132	132
Within R^2	0.016	0.095	0.137

Notes: Standard errors clustered at the teacher level between parentheses. *, **, and *** indicate significance based on a two-sided test at the .10, .05, and .01 level, respectively. The variable $\Delta self$ indicates the difference between a teacher's first-period average self-assessment score and her average first-period student evaluation score.

We have seen that on average, teachers' self-assessment is much more favorable than the evaluations by their students. Hence, student's evaluations may help teachers in making a more realistic assessment of their own performance. As teachers were asked to complete the self-assessment in both waves, we can examine whether teachers use the feedback to update the self-assessment of their performance. Table 5.6 reports the effects of receiving feedback on teachers' self-assessment. The estimation reported in the first column only includes a treatment dummy, a year dummy, and teacher fixed effects. We find that, on average, teachers who have received feedback evaluate themselves worse in the second wave compared to teachers who have not received feedback. The average treatment effect is -0.067, but statistically insignificant. The estimation reported in the second column adds the interaction between the treatment dummy and the difference between teachers' first-period self-

assessment score and their students' first-period evaluation scores. As expected, the interaction effect is negative, but statistically insignificant. In column 3, we add a quadratic interaction term. As depicted in Figure 5.6, we find no significant effect of the treatment for teachers who learn that they underestimate their own performance. In contrast, teachers who learn that their own assessment is more positive than their students' evaluations assess themselves significantly less positive in the second wave, compared to similar teachers who do not receive feedback. The effect of the treatment on a teacher's self-assessment remains similar in sign and magnitude but loses statistical significance for teachers whose own assessment is more than one point higher than their average student evaluation score.

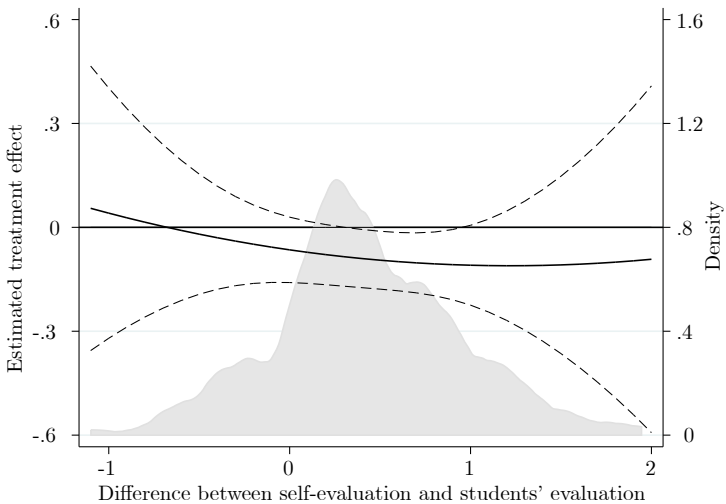

Figure 5.6: Estimated effect of feedback on teachers' self-evaluation

Notes: This figure shows the estimated treatment effect on teachers' average self-evaluation score given the difference between a teacher's first-period average self-evaluation score and her average first-period student evaluation score ($\Delta self_i$). Dashed lines show the 90% confidence interval. The transparent grey area shows a kernel density of the observations.

Table 5.7: Effect of feedback on job satisfaction of teachers

Dependent variable: job satisfaction					
	(1)	(2)	(3)	(4)	(5)
Treatment	-0.068	-0.257	-0.149	-0.047	-0.070
	(0.133)	(0.214)	(0.233)	(0.134)	(0.177)
Δself		-0.407	0.174		
		(0.262)	(0.567)		
Δself^2			-0.415		
			(0.360)		
Δself $\times$ treatment		0.292	-0.125		
		(0.321)	(0.649)		
$\Delta\text{self}^2 \times$ treatment			0.252		
			(0.449)		
Δteam				0.274	0.229
				(0.211)	(0.231)
Δteam^2					-0.165
					(0.348)
Δteam $\times$ treatment				-0.419	-0.395
				(0.283)	(0.320)
$\Delta\text{team}^2 \times$ treatment					0.104
					(0.476)
Intercept	3.632***	4.079***	4.115***	3.625***	3.691***
	(0.583)	(0.685)	(0.687)	(0.583)	(0.611)
Control variables	Yes	Yes	Yes	Yes	Yes
Observations	162	130	130	162	162
R^2	0.032	0.053	0.066	0.046	0.057

Notes: Standard errors between parentheses. *, **, and *** indicate significance based on a two sided test at the .10, .05, and .01 level, respectively. Control variables are gender, age, tenure, and full-time equivalent. The variable $\Delta self$ indicates the difference between a teacher's first-period average self-assessment score and her average first-period student evaluation score. The variable $\Delta team$ indicates the difference between a teacher's first-period average student evaluation score and average of all first-period average student evaluation scores of the teachers in her team.

Lastly, we examine whether receiving feedback affects teachers' job satisfaction. Teachers may be positively or negatively surprised about their average evaluation score, leading to feelings of pride or resentment. Similarly, learning that one's performance is better or worse than the performance of direct colleagues may affect job satisfaction as a result of status concerns or conformity preferences. Table 5.7

reports the effect of receiving feedback on teachers' job satisfaction. The estimation reported in the first column includes only the treatment dummy. We find that on average, receiving feedback has no effect on job satisfaction. The estimated effect is -0.068 and statistically insignificant. The estimation in the second column adds an interaction between the treatment dummy and the difference between teachers' first-period self-assessment score and their students' first-period evaluation scores. Surprisingly, the estimated interaction effect is positive, but insignificant. Column 3 adds a quadratic interaction term. The results of this estimation are depicted Figure 5.7. The effect of receiving feedback is very close to zero and nowhere statistically significant.

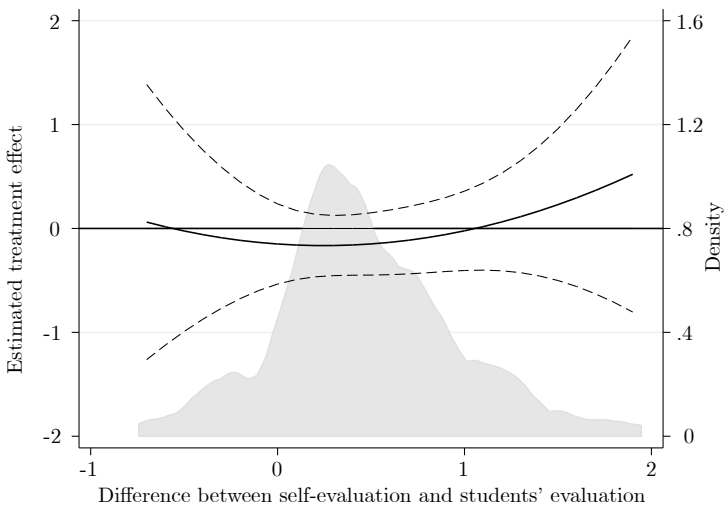

Figure 5.7: Estimated effect of feedback on teachers' job satisfaction by the difference between a teacher's self-evaluation score and her student evaluation score

Notes: This figure shows the estimated treatment effect on job satisfaction of teachers given the difference between a teacher's first-period average self-evaluation score and her average first-period student evaluation score ($\Delta self_i$). Dashed lines show the 90% confidence interval. The transparent grey area shows a kernel density of the observations.

In columns 4 and 5 of Table 5.7, we interact the treatment dummy with the difference between a teacher's first-period average student evaluation score and her team's average student evaluation score. The estimated interaction effect is negative and insignificant, and the coefficient on the quadratic interaction term in column 5 is close to zero. Figure 5.8 depicts the results of the estimation as reported in column 5 of Table 5.7. We find that the effect of receiving feedback on job satisfaction is insignificant both for teachers whose evaluation scores are above their teams' average as well as for teachers who perform worse than their direct colleagues. Hence, we find no effect of performance feedback on job satisfaction.

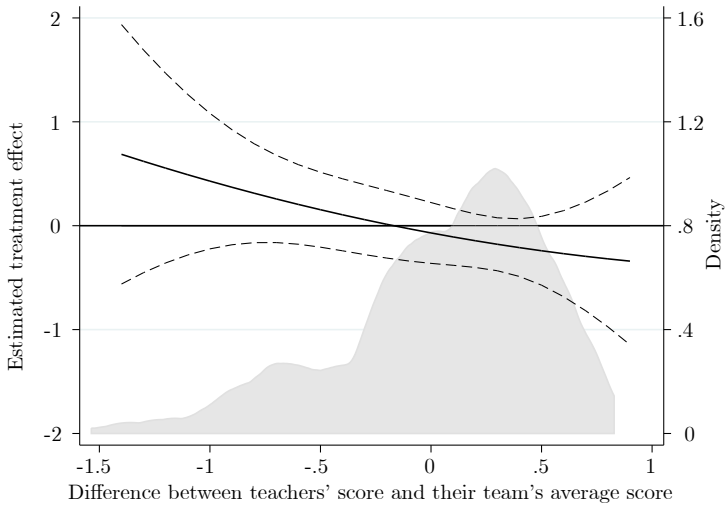

Figure 5.8: Treatment effect on teachers' job satisfaction by the difference between a teacher's own student evaluation score in the first wave and her team's average score

Notes: Figure shows the estimated treatment effect on job satisfaction of teachers given the difference between a teacher's first-wave average student evaluation score and average of all first-wave average student evaluation scores of the teachers in her team ($\Delta team_i$). Dashed lines show the 90% confidence interval. The transparent grey area shows a kernel density of the observations.

5.6 Conclusion

This chapter has studied the effects of receiving students' feedback on teacher performance as measured by student evaluations one year later. We find that on average, receiving students' feedback has no effect on teacher performance. This contrasts with recent studies on short-run effects of performance feedback, which tend to find positive effects. Our study suggests that effects of feedback may be short-lived. A possible remedy might be to provide feedback more frequently. It would be interesting to examine in a future field experiment how teachers respond to more frequent feedback, and to learn about the dynamics of their response.

Additionally, we examined whether the response to feedback depends on the content of feedback. We found that teachers who learn that their students' assessment is much less favorable than their own assessment improve performance after receiving feedback. These teachers also moderate their self-assessment, albeit to a limited extent. We found no evidence that teachers' job satisfaction is affected by (the content of) feedback. Lastly, we found that teachers who learn that they do worse than their team improve, unless their score is far below the team average.

5.A Appendix

An example of an evaluation form given to students (translated from Dutch to English):

		Disagree	Disagree somewhat	Disagree somewhat / agree somewhat	Agree somewhat	Agree	Do not know /not applicable
1	The teacher is well able to answer questions about the contents of the course	☐	☐	☐	☐	☐	☐
2	The teacher ensures variety in class	☐	☐	☐	☐	☐	☐
3	The teacher keeps me interested	☐	☐	☐	☐	☐	☐
4	The teacher adapts to what I already know and can do	☐	☐	☐	☐	☐	☐
5	The teacher is able explain the connection to the real world	☐	☐	☐	☐	☐	☐
6	The teacher is well able to answers my questions	☐	☐	☐	☐	☐	☐
7	The teacher makes me feel comfortable in class	☐	☐	☐	☐	☐	☐
8	The teacher is able to maintain order in class	☐	☐	☐	☐	☐	☐
9	The teacher deals with all students in an equal manner	☐	☐	☐	☐	☐	☐
10	The teacher stimulates indepency in my work	☐	☐	☐	☐	☐	☐
11	The teacher is clear in his expectations of me	☐	☐	☐	☐	☐	☐
12	The teacher checks whether I did my assignments or homework	☐	☐	☐	☐	☐	☐
13	The teacher is consistent in adhering to appointments	☐	☐	☐	☐	☐	☐
14	The teacher answers e-mails in time (2 workdays)	☐	☐	☐	☐	☐	☐
15	The teacher grades assignments within 14 days	☐	☐	☐	☐	☐	☐
16	Im able to have a discussion with my teacher if I disagree with the teacher	☐	☐	☐	☐	☐	☐
17	The teacher takes me seriously	☐	☐	☐	☐	☐	☐
18	The teacher adresses students regarding their behavior	☐	☐	☐	☐	☐	☐
19	The teacher is an example to me in both speech and behavior	☐	☐	☐	☐	☐	☐
20	Comments/recommendations: you can leave any comments or tips here using up to 300 characters.						

Name participant: [redacted] Class: [redacted]
Name teacher: [redacted]

Table 5.A: The effect of feedback content on attrittion (probit estimates)

Dependent variable: drop-out after first year			
	(1)	(2)	(3)
Treatment	-0.178	-0.490	-0.188
	(0.188)	(0.294)	(0.191)
Δself		-0.236	
		(0.240)	
Δself × treatment		0.356	
		(0.414)	
Δteam			-0.110
			(0.258)
Δteam × treatment			-0.310
			(0.384)
Intercept	-2.530***	-1.484	-2.493***
	(0.866)	(0.989)	(0.870)
Control variables	Yes	Yes	Yes
Observations	282	198	282
Pseudo R^2	0.067	0.081	0.075

Notes: *, **, and *** indicate significance based on a two-sided test at the .10, .05, and .01 level, respectively. Control variables are gender, age, tenure, and full-time equivalent. The variable $\Delta self$ indicates the difference between a teacher's first-period average self-assessment score and her average first-period student evaluation score. The variable $\Delta team$ indicates the difference between a teacher's first-period average student evaluation score and average of all first-period average student evaluation scores of the teachers in her team.

Chapter 6

Summary and Directions for Further Research

Production in public organizations is highly labor intensive. Learning about the motivations of public sector workers is, therefore, vital to our understanding of public sector performance. The first part of this thesis empirically investigated the difference in motivations between workers in the public sector and the private sector. In particular, it studied three closely related topics: Are altruistic workers more likely to be employed in the public sector when their mission preferences align with the mission of the public sector? Are public sector workers more likely to rate themselves as altruistic and lazy as compared to private sector workers? And, are government workers more satisfied with their job when their own mission preferences match the mission preferences of the politicians in office? The last part of this thesis studied one possible way to motivate workers in the public sector. A field experiment was conducted at a large Dutch school for intermediate vocational education. We answered the question whether the provision of students' feedback to teachers may help improve the performance of teachers. The remainder of this chapter provides a summary of the studies in this thesis and offers some directions for further research.

6.1 Summary

A large literature in public administration and economics has shown that public sector workers report a strong willingness to help others or to serve the public interest at large (see Perry et al. 2010 for an overview). In chapter 2 my co-author and I proposed that public sector workers might differ in their valuation of the public sector's mission. That is, not all workers may feel that the mission of the public sector contributes to the public interest. We have studied how workers' altruism and the alignment of their mission preferences with the mission of the public sector jointly affect the likelihood of public sector employment.

This idea was formalized by developing a very simple model, building on Besley and Ghatak (2005), where workers differ in their altruism and their valuation of the public sector's mission. Our model predicts that altruism and mission alignment are mutually reinforcing. The likelihood of public sector employment increases in altruism for workers who feel that the public sector's mission serves the public interest, decreases in altruism for workers who feel that the public sector's mission harms the public interest, and is unaffected for indifferent workers. Likewise, the likelihood of public sector employment increases in mission alignment for altruistic workers, decreases in mission alignment for spiteful workers, and is unaffected for selfish workers.

We have tested our predictions using survey data from the World Values Survey, covering a broad range of countries over the world. Our data set contains information on workers' sector of employment, their willingness to help others (altruism), and their confidence in political parties (which is used as a proxy for mission alignment). The results of our empirical analysis are very much in line with our theoretical predictions. We have found a strong mutually reinforcing relation between a worker's altruism and mission alignment on the likelihood of public sector employment. Moreover, we found that the mutually reinforcing relation between altruism and mission alignment is especially strong among highly educated workers and in less-developed countries. Workers who are highly altruistic and report strong confidence in political parties are significantly more likely to work in the public sector as compared to workers with average altruism and confidence. Workers with low altruism and weak

confidence are significantly less likely to work in the public sector. The difference in probability between these two groups is substantial. Finally, workers with high altruism and weak confidence and workers with low altruism and strong confidence are neither more nor less likely to work in the public sector. Among the higher educated workers the latter two groups have a significant lower likelihood of working in the public sector. A possible explanation may be that conflicting mission preferences or spite discourage some highly educated people from working in the public sector.

There are two possible explanations for the sorting patterns we have found. The sorting patterns may follow from selection into the public sector (see, e.g., models by Handy and Katz 1998, Francois 2000 and 2007, Delfgaauw and Dur 2008) or from preference adaptation by working in the public sector (see Wright and Grant 2010 for a discussion). We cannot rule out that the patterns we find are nonexistent for workers who just started their career and arise from adaptation of preferences by working in the public sector. Following this explanation of the results some workers become more altruistic and gain confidence in political parties by working in the public sector. However, existing evidence points in the other direction for workers' altruism. A number of empirical studies have shown that workers' altruism in the public sector decreases rather than increases with work experience (Blau 1960, Van Maanen 1975, Moynihan and Pandey 2007, De Cooman et al. 2009, and Buurman et al. 2012).

Chapter 3 studied a closely related topic. We examined whether public sector workers rate themselves as more altruistic and lazy as compared to private sector workers. First, we developed a theoretical model of sorting to the public sector where workers differ in their altruism (willingness to help others) and their laziness (cost of effort). Our model predicts that the likelihood of public sector employment increases in a worker's altruism, and increases or decreases in a worker's laziness depending on his altruism. Altruistic workers are more likely to work in the public sector because of the opportunity to contribute to the welfare of others. The effect of laziness on sorting is more indirect. A lazy worker's choice of sector is driven by the sectoral difference in benefits and cost unrelated to effort and not by the sectoral difference in rewards for performance, because working hard is costly for a

lazy worker. Hence, the likelihood of public sector employment increases in laziness for selfish workers, because more lazy workers prefer the benefits unrelated to effort in the public sector (such as the base wage) over the high rewards for performance in the private sector. Reversely, the likelihood of public sector employment decreases in laziness for highly altruistic workers, because more lazy workers benefit less from the relatively high intrinsic rewards for performance in the public sector. Summarizing, our model predicts a negative interaction effect between a worker's altruism and laziness on the likelihood of public sector employment.

These predictions were empirically tested using survey data on German workers from the German Socio-Economic Panel study. In line with our theoretical model we found that public sector workers rate themselves significantly more altruistic and lazy as compared to private sector workers. We did not find evidence of a negative interaction between a worker's altruism and laziness. Together these results imply that workers who are highly altruistic and lazy are significantly most likely to work in the public sector. Workers who are selfish and energetic are significantly least likely to work in the public sector. A possible explanation for the lack of a significant interaction effect may be that public sector workers' contribution to society is partly independent of their effort. For instance, because the difference between the public sector wage and the private sector wage may already be considered as a contribution to the public interest.

We additionally examined whether sorting patterns are different for workers with different levels of work experience. Sorting patterns may be related to work experience in two ways. First, workers may spend the initial years of their career on 'job-shopping'. That is, workers may be holding jobs that are not a good match with their tastes and abilities (see the models by Johnson 1978, Jovanovic 1979, and Neal 1999). Second, the preferences of workers may adapt to experience, for instance due to organizational socialization (Brewer 2008). Following this line of reasoning we expect either stronger of weaker sorting patterns for more experienced workers. Our results show that the difference in altruism between public sector and private sector workers is already present at the start of their career, and for the most part, this remains the same throughout their career. We did find a statistically significant

relation between laziness and work experience. At the start of workers' careers there are no significant differences in laziness between public sector and private sector workers. However, this difference increases for more experienced workers. Whether this is the result of job-shopping or preference adaptation is hard to uncover using the current data.

Chapter 4 studied the motivations of government workers in more detail. Government workers carry out tasks on behalf of the government in office. The objectives of government organizations are described in the mission of the government, which is set by the elected politicians in office. Government workers may differ from politicians in their preferred mission of the government. In this chapter I empirically studied whether the mission motivation of government workers matters for their satisfaction with their job. Mission motivation may matter for job satisfaction when workers enjoy working on missions that are in line with their own preferences regarding the mission of the government.

The used data come from the Longitudinal Internet Studies for the Social sciences. My sample contains data on Dutch workers, covering their individual characteristics, employment details, and political preferences. Workers' reported voting in parliamentary elections is used to construct a measure of mission alignment. A worker's mission preferences are classified as a match to the government's mission when a worker voted for one of the political parties that has taken up office after the election. A worker who voted for a political party that does not take up office is classified as a nonmatching worker. In estimating the effect of this variable on job satisfaction I exploited the fact that the mission of the government changes when new political parties take up office. It is examined whether a government worker's job satisfaction changes after a change in a worker's mission alignment.

The results of the empirical analysis clearly show that mission motivation of government workers is important for their satisfaction with their job. Government workers are more satisfied with their job when their mission preferences match those of the politicians in office as compared to when their mission preferences do not match. The difference in job satisfaction is both economically and statistically significant. The alignment of mission preferences does not affect job satisfaction of

workers employed outside the government sector.

In addition, I investigated whether it matters for a worker's job satisfaction which other political parties join the coalition government. In the Netherlands, the government in office consists of a coalition of political parties. This implies that political parties often have to compromise when making policy plans. In line with this idea my results show that, next to a worker's first preference (as measured by their reported vote), it is also important which other parties join a coalition government. Government workers with a more positive stance towards all political parties in a coalition government are significantly more satisfied with their job as compared to workers with a more negative stance.

In the last study of this thesis my co-authors and I focus on an important public service that is provided predominantly by the public sector, namely education. Many governments will consider good education as one of their top priorities. The provision of education is highly labor intensive, hence, the performance of teachers plays a crucial role in the provision of good education. In chapter 5 we studied whether receiving performance feedback matters for the performance of teachers.

We conducted a field experiment at a large Dutch school for intermediate vocational education to study the effect of students' feedback on teachers' performance. Teachers' performance was measured by having students evaluate their teachers using a questionnaire with 19 items about the performance of teachers. After collecting this information we implemented our feedback treatment. A randomly chosen group of teachers was provided with their outcomes of the students' evaluations. We determined the effect of receiving feedback by having teachers evaluated by students again in the next year. Teachers were also provided with information on the average evaluation outcome of their team as a whole and teachers were asked to give a self-assessment of performance both before and after receiving feedback.

The results show that receiving feedback on performance does not affect the subsequent performance of teachers. We have found a precisely estimated zero average treatment effect. Additionally, we investigated whether the content of the feedback matters for the effect of receiving feedback. First, the effect of receiving feedback is estimated dependent on whether teachers assess their own performance

differently than students evaluate their performance. Teachers who assess their own performance similarly to the students' evaluation show no response to the feedback treatment. We do find a positive treatment effect for teachers who assess their own performance a lot more positively as compared to the students' assessment. Next, the effect of receiving feedback is estimated for workers who learn they perform better or perform worse than their team as a whole. We found no clear relation between the effect of feedback and the difference between a teacher's own performance and the average performance of their team.

Learning about past performance may motivate workers (e.g. when they are intrinsically motivated) but is also a way of informing workers about their past performance. We examined whether teachers who receive feedback adjust their self-assessment of performance when they learn from the feedback that there is a discrepancy between their self-assessment and the students' assessment. Our results show that teachers who learn that they assess their own performance more favorably than students lower their self-assessment of performance afterwards. However, the estimated effect loses statistical significance for teachers who assess their performance a lot more favorably.

6.2 Directions for further research

This thesis has studied the motivations of public sector workers. In chapters 2 and 4 we have studied the importance of the alignment of a worker's mission preferences with the mission of the public sector (or the government's mission in particular). We found that mission motivation is important for sorting and job satisfaction. An interesting issue that remains is what the ideal motivational composition of the government workforce is, given that workers differ in their mission preferences. To properly address this issue we need to build a better understanding of how mission motivation affects behavior at the workplace. For instance, it would be interesting to explore whether the mission motivation of government workers also affects their effort and performance on the job (as in the lab experiments mentioned in section 1.1). Relatedly, nonmatching workers might be more easily tempted to frus-

trate, influence or even sabotage the implementation of government policy. From the politician's perspective it could, therefore, be optimal to hire only workers whose mission preferences match those of the politician's. However, from society's perspective it may be optimal to hire a mixed workforce that resembles the preferences of society as a whole.

Closely related, mission preferences may also be important for sorting within the government organization. That is, mission preferences might influence the promotion opportunities of government workers. Politicians in office might prefer to have workers with strongly aligned mission preferences at key positions within the government organization. As a result, workers with matching mission preferences might be promoted to such positions more easily. Summarizing, in future research it would be interesting to examine the role of mission motivation at the government workplace.

The final study in this thesis has shown that receiving feedback has no effect on the performance of teachers. However, receiving feedback may affect workers differently when they care about their output. Receiving feedback from recipients of public services, such as students, may influence motivated workers in the following ways. First, workers motivated to contribute to the well-being of others might adapt or increase their efforts when they learn from the feedback that their efforts are badly reviewed. They might be willing to look for new ways in which to improve the well-being of recipients. Receiving negative feedback from recipients may also have a negative effect on motivated workers' performance. Motivated workers might get discouraged from working hard when they learn that their effort and output are not very highly appreciated by the recipients. This hypothesis also fits well with the empirical literature on motivations of public sector workers. A number of studies have shown that the altruistic motivations of public sector workers decreases with work experience (Blau 1960, Van Maanen 1975, Moynihan and Pandey 2007, De Cooman et al. 2009, and Buurman et al. 2012). While workers might join the public sector due to an intrinsic motivation to help others, they might gradually learn from receiving recipient feedback that their contributions are poorly appreciated.

Recipients may also give positive feedback to public sector workers. Receiving

positive feedback may affect motivated workers differently than receiving negative feedback. Motivated workers might respond more strongly to positive feedback, as this may serve as an acknowledgement that their contributions are appreciated and that they can really make a difference in people's lives. As a possible extension of our field experiment in chapter 5 it would be interesting to find a good measure of intrinsic motivation and examine how the effect of feedback interacts with this measure of motivation.

Samenvatting
(Summary in Dutch)

Introductie

De publieke sector vormt een belangrijk onderdeel van onze economie. Volgens schattingen door het OECD (2008) is een groot deel van de beroepsbevolking in OECD-landen werkzaam in de publieke sector.[1] Werknemers in de publieke sector leveren een grote verscheidenheid aan goederen en diensten aan de samenleving. Voorbeelden van diensten die publiek geleverd worden zijn onder andere onderwijs, zorg, openbaar vervoer, afvalverwerking en het houden van de openbare orde. Deze verscheidenheid aan publieke diensten doet vermoeden dat alle mensen, op een bepaald moment in hun leven, geconfronteerd worden met of gebruik maken van publiek geleverde diensten. De prestaties van organisaties in de publieke sector krijgen daardoor veel aandacht van de samenleving. Bovendien worden publieke diensten betaald met belastinggeld. Burgers verwachten kwalitatief goede diensten en waar voor belastinggeld.

De productie van publieke goederen en diensten is zeer arbeidsintensief. De inspanningen en prestaties van werknemers in de publieke sector zijn van doorslaggevend belang voor de productie van kwalitatief goede publieke diensten. Het kan echter kostbaar en lastig zijn om werknemers in de publieke sector te prikkelen om harder te werken. Prestaties in de publieke sector zijn over het algemeen lastig te meten en controleren, dit komt ook tot uiting in de manier waarop prestaties beoordeeld wor-

[1] De OECD schat dat 6 tot 29 procent van de beroepsbevolking in OECD-landen werkzaam is bij de overheid of andere publieke organisaties.

den in de publieke sector. Prestatiebeoordeling in de publieke sector komt relatief weinig voor en, als het voorkomt, is het vaak verbonden aan zwakke prikkels (zie Burgess en Metcalfe 1999). Daarom zijn de intrinsieke werkmotivaties van werknemers in de publieke sector in grote mate bepalend voor de prestatie van de publieke sector. Een beter begrip van de motivaties van deze werknemers kan bijdragen aan een beter begrip van de prestatie van publieke organisaties.

Dit proefschrift draagt bij aan de groeiende literatuur over motivaties van werknemers in de publieke sector. In het eerste deel van dit proefschrift worden verschillen in motivaties tussen werknemers in de publieke sector en de private sector bestudeerd. Er zijn twee sterk gerelateerde onderwerpen in het bijzonder bestudeerd. Eerst is onderzocht hoe het altruïsme van een werknemer en zijn waardering voor de missie van de publieke sector gezamenlijk de kans beïnvloeden dat een werknemer werkzaam is in de publieke sector. Daarnaast is geanalyseerd of werknemers in de publieke sector zichzelf als meer altruïstisch en luier schatten dan werknemers in de private sector. Vervolgens worden in hoofdstuk 4 de motivaties van ambtenaren in het bijzonder bestudeerd. In dit hoofdstuk wordt empirisch onderzocht of ambtenaren vaker aangeven tevreden te zijn met hun werk als hun eigen missievoorkeuren overeenkomen met de missievoorkeuren van de regerende politici. In het laatste deel van het proefschrift is voor een enigszins andere aanpak gekozen, er is één mogelijke manier bestudeerd om medewerkers in de publieke sector te motiveren. Er is een veldexperiment uitgevoerd bij een grote Nederlandse school voor mbo-onderwijs en er is onderzocht of het geven van feedback aan docenten de prestaties van docenten kan verbeteren.

Het resterende deel van deze samenvatting is als volgt opgebouwd. De volgende sectie bespreekt de huidige inzichten in intrinsieke motivaties van werknemers en de gevolgen voor de publieke sector. Daarna zal een korte discussie volgen over feedback en, in het bijzonder, feedback als prikkel voor prestaties. Dit hoofdstuk sluit af met een samenvatting van de studies in dit proefschrift.

Intrinsieke motivaties in de publieke sector

Het doorgronden van motivaties is doorslaggevend in het begrijpen van elke vorm van gedrag. Elke actie die ondernomen wordt, is een gevolg van een motivatie om deze actie te ondernemen. Motivaties kunnen voortkomen uit verscheidene bronnen en kunnen verschillen in richting en intensiteit. Een klassiek onderscheid in soorten motivatie wordt gegeven door Ryan en Deci (2000), zij maken onderscheid tussen intrinsieke motivatie en extrinsieke motivatie. Een persoon wordt beschouwd als intrinsiek gemotiveerd als deze persoon plezier of voldoening ontleent aan de actie zelf. Extrinsieke motivatie komt voort uit gevolgen die los staan van de actie zelf, zoals druk of beloningen. Op de werkvloer bestaan zulke beloningen of druk uit bijvoorbeeld financiële prikkels, mogelijkheden tot promotie, sociale waardering of lof. De intrinsieke motivaties van werknemers staan centraal in het eerste deel van dit proefschrift.

Intrinsieke motivaties zijn uitgebreid bestudeerd bij werknemers in de publieke sector. In hun invloedrijke artikel beschrijven Perry en Wise (1990) het concept 'public service motivation'. Zij definiëren motivatie voor de publieke zaak als een "aanleg om te reageren op motivaties die voornamelijk of alleen voorkomen bij werk in publieke instellingen en organisaties" (p. 368). Perry en Wise stellen dat mensen met een hoge motivatie voor de publieke zaak een grotere kans hebben om in de publieke sector te werken en beter presteren in een baan in de publieke sector. Ze beschrijven drie bronnen van motivatie voor de publieke zaak: deelname aan het formuleren van beleid, betrokkenheid bij een beleidsonderwerp en de wil om bij te dragen aan het openbaar belang. Het streven naar deelname aan het formuleren van beleid is sterk gerelateerd aan persoonlijk welzijn. Dit streven kan voortkomen uit een persoonlijke behoefte aan een spannende en uitdagende baan of misschien zelfs uit overwegingen gerelateerd aan zelfbeeld of status. De betrokkenheid bij een beleidsonderwerp en de wil om bij te dragen aan het openbaar belang is meer gerelateerd aan een algemene toewijding aan het welzijn van anderen. Deze toewijding aan het welzijn van anderen heeft de meeste aandacht gekregen binnen de literatuur over motivaties van werknemers in de publieke sector (zie Perry et al. 2010).

In later onderzoek is 'public service motivation' vaak gelijkgesteld aan generieke

gevoelens van altruïsme (Rainey en Steinbauer 1999). Altruïstische motivaties zijn gedefinieerd als "gemotiveerd zijn uit overwegingen met betrekking tot de behoefte van anderen in plaats van eigen behoefte" (Piliavin en Charng 1990: p. 30). Met andere woorden, altruïsme is een verlangen om anderen te helpen zonder directe voordelen voor de persoon zelf. Dit verlangen om anderen te helpen kan voortvloeien uit gevoelens van empathie, sympathie of mededogen. Recente economische theorieën bouwen voort op deze ideeën en maken de aanname dat werknemers intrinsiek geven om het publieke belang (zie Tonin en Vlassopoulos 2008 voor een overzicht). Een gedeelde bevinding in deze sterk groeiende literatuur is dat het voor publieke organisaties optimaal is om relatief lage lonen te bieden en zo de zelfselectie van gemotiveerde werknemers naar de publieke sector te versterken (Handy en Katz 1998, Delfgaauw en Dur 2007). Binnen deze theorieën wordt vaak aangenomen dat de toewijding aan het publieke belang een gevolg is van altruïstische motivaties; dit kunnen zuiver altruïstische motivaties of onzuiver altruïstische motivaties zijn (zie ook Andreoni 1990 voor een discussie over altruïsme). Werknemers gemotiveerd door een onzuivere vorm van altruïsme geven intrinsiek om hun persoonlijke bijdrage aan de publieke zaak; deze werknemers ervaren een 'warm gevoel' als gevolg van hun bijdrage. Werknemers kunnen ook gemotiveerd zijn door zuiver altruïstische motivaties. Werknemers gemotiveerd door zuiver altruïsme geven om het publieke belang in het algemeen; deze werknemers geven om de totale bijdrage aan het publieke belang. Deze werknemers nemen in overweging dat wanneer zij niet zelf bijdragen aan het publieke belang, anderen hun plaats zullen innemen en dat wel zullen doen.

Een andere belangrijke en sterk gerelateerde literatuur bestudeert de missiemotivatie van werknemers. Veel organisaties hebben een specifieke missie. De missie van een organisatie beschrijft de primaire functie en de doelstellingen van een organisatie. Voor organisaties in de publieke sector beschrijft de missie hoe publieke organisaties bijdragen aan het publieke belang. Besley en Ghatak (2005) ontwikkelden een model waarin werknemers verschillen in missievoorkeuren; dat wil zeggen, werknemers verschillen in hun waardering van de missie van een organisatie. Besley en Ghatak laten zien dat er een premie bestaat op het overeenkomen van missievoorkeuren, met als gevolg dat werknemers kiezen om bij een organisatie te werken waarmee

zij missievoorkeuren delen. Een aantal (lab)experimentele studies heeft de rol van missievoorkeuren bestudeerd (Tonin en Vlassopoulos 2010, 2012, Gerhards 2012, Carpenter en Gong 2013, en Fehrler en Kosfeld 2014). Een gemeenschappelijke bevinding is dat proefpersonen waarbij de missievoorkeuren aansloten bij de uitgevoerde taak meer inspanning uitoefenden in hun werk dan proefpersonen waarbij de missievoorkeuren minder goed aansloten bij de uitgevoerde taak. Bovendien, en in lijn met de studies hierboven, kan de zelfselectie van werknemers naar taken met overeenkomende missievoorkeuren gestimuleerd worden door een lager basisloon te bieden.

Feedback als prikkel voor prestaties

Veel organisaties verzamelen informatie over de prestaties van hun werknemers. Deze informatie wordt gebruikt om prestaties te beoordelen, maar ook om toekomstige prestaties van werknemers te verbeteren. De informatie over prestaties wordt vaak naar de werknemer teruggekoppeld als informele feedback of als formele feedback in een functioneringsgesprek. In het laatste deel van dit proefschrift bestuderen we het effect van het ontvangen van feedback op de prestaties van werknemers. Feedback op prestaties is gedefinieerd als "acties ondernomen door een extern persoon met als doel het informeren van de ontvanger over aspecten van de prestatie" (Kluger en DeNisi 1996: p. 255). Leren over prestaties uit het verleden kan effect hebben op toekomstige prestaties wanneer werknemers intrinsiek of extrinsiek geven om prestaties (bijvoorbeeld als gevolg van intrinsieke motivatie of prestatieprikkels). De effectiviteit van feedback in het verbeteren van prestaties is een punt van stevige discussie onder psychologen en bedrijfskundigen. In een overzicht en meta-analyse van de psychologische literatuur vinden Kluger en DeNisi (1996) dat het ontvangen van feedback over prestaties maar in twee derde van alle onderzochte studies een positief effect heeft op toekomstige prestaties. Alvero et al. (2001) vinden een vergelijkbaar resultaat wanneer zij de bedrijfskundige literatuur bestuderen, ook hier geldt dat het ontvangen van feedback niet altijd leidt tot betere prestaties. In een poging om deze gemengde resultaten te verklaren benadrukken Alvero et al. (2001) het belang van de bron (bijv. de manager of onderzoeker), het medium (bijv.

verbaal of schriftelijk) en de inhoud van de feedback.

In veel organisaties wordt relatieve feedback gegeven. Relatieve feedback bestaat uit informatie over de prestaties van een werknemer ten opzichte van een vooropgesteld doel of de prestaties van collega's. Feedback over relatieve prestaties kan effect hebben op de prestaties van een werknemer wanneer werknemers gevoelig zijn voor status of sociale erkenning (Moldavanu et al. 2007, Besley en Ghatak 2008, Auriol en Renault 2008) of wanneer werknemers zich willen conformeren aan sociale normen (Bernheim 1994). Een aantal studies heeft met experimenteel onderzoek laten zien dat relatieve feedback een positief effect kan hebben op prestaties (Azmat en Iriberri 2010, 2014, Blanes i Vidal en Nossol 2011, Kuhnen en Tymula 2012, Tran en Zeckhauser 2012, Delfgaauw et al. 2013, Gerhards en Siemer 2014). Barankay (2012) en Bandiera et al. (2013) vinden echter dat relatieve feedback ook een nadelig effect op prestaties kan hebben.

Overzicht van de hoofdstukken

Een uitgebreide bestuurskundige en economische literatuur heeft aangetoond dat werknemers in de publieke sector een grotere bereidheid tonen om anderen te helpen of het publieke belang te dienen (zie Perry et al. 2010 voor een overzicht). In hoofdstuk 2 stellen mijn co-auteur en ik dat werknemers verschillen in hun waardering van de missie van de publieke sector. Dat wil zeggen dat mogelijk niet alle werknemers van mening zijn dat de missie van de publieke sector het publieke belang dient. We bestuderen hoe altruïsme en de overeenkomst van missievoorkeuren van een werknemer met de missie van de publieke sector gezamenlijk de kans beïnvloeden dat een werknemer in de publieke sector werkt.

We hebben onze ideeën gestructureerd door een simpel model te ontwikkelen, voortbouwend op het werk van Besley en Ghatak (2005), waar werknemers verschillen in hun altruïsme en waardering voor de missie van de publieke sector. Ons model voorspelt dat altruïsme en de gelijkenis van missievoorkeuren elkaar wederzijds versterken. Altruïstische werknemers hebben een grotere kans om in de publieke sector te werken wanneer zij van mening zijn dat de missie van de publieke sec-

tor de publieke zaak dient en hebben een kleinere kans om in de publieke sector te werken wanneer zij van mening zijn dat de missie van de publieke sector de publieke zaak schaadt. Als een werknemer onverschillig is, heeft altruïsme geen invloed. Andersom geldt dat werknemers met overeenkomende missievoorkeuren een grotere kans hebben om in de publieke sector te werken wanneer zij altruïstisch zijn en een kleinere kans hebben om in de publieke sector te werken wanneer zij afgunstig zijn. De kans wordt niet beïnvloed voor egoïstische werknemers.

We hebben onze voorspellingen getest met enquêtegegevens uit de World Values Survey, dat gegevens bevat uit een groot aantal landen. Onze dataset bevat informatie over de sector waarin een werknemer werkzaam is, de bereidheid om anderen te helpen (altruïsme) en het vertrouwen in politieke partijen (wat wij gebruiken als indicator voor de gelijkenis van missievoorkeuren). De bevindingen uit onze empirische analyse zijn sterk in lijn met onze theoretische voorspellingen. We hebben een wederzijds versterkende relatie gevonden tussen altruïsme en de gelijkenis van missievoorkeuren op de kans dat een werknemer werkzaam is in de publieke sector. De resultaten laten bovendien zien dat deze wederzijds versterkende relatie vooral belangrijk is voor hoog opgeleide werknemers en voor werknemers in minder ontwikkelde landen. Werknemers die zeer altruïstisch zijn met een hoog vertrouwen in politieke partijen tonen een significant hogere kans om in de publieke sector te werken dan werknemers met gemiddeld altruïsme en vertrouwen. Werknemers die beperkt altruïstisch zijn met laag vertrouwen in politieke partijen tonen een significant lagere kans om in de publieke sector te werken. Tot slot werken zeer altruïstische werknemers met laag vertrouwen en beperkt altruïstische werknemers met hoog vertrouwen niet meer of minder waarschijnlijk in de publieke sector. In de groep van hoog opgeleide werknemers hebben de laatste twee groepen zelfs een lagere kans om in de publieke sector te werken. Een mogelijke verklaring hiervoor is dat conflicterende missievoorkeuren of afgunst sommige werknemers ontmoedigt om in de publieke sector te werken.

Er bestaan twee mogelijke verklaringen voor de resultaten die we hebben gevonden. Onze resultaten kunnen het gevolg zijn van zelfselectie naar de publieke sector (zie bijvoorbeeld Handy en Katz 1998, Francois 2000 en 2007, Delfgaauw en Dur

2008) of het gevolg zijn van werknemers die hun voorkeuren aanpassen aan de sector waarin zij werken (zie Wright en Grant 2010 voor een discussie). Het kan zo zijn dat de gevonden resultaten niet opgaan voor werknemers aan het begin van hun carrière. De resultaten zouden dan tot stand zijn gekomen doordat werknemers hun voorkeuren aanpassen aan de publieke sector als ze eenmaal in die sector werkzaam zijn. In lijn met deze mogelijke verklaring zouden sommige werknemers meer altruïstisch worden en een hoger vertrouwen in politieke partijen krijgen door te werken in de publieke sector. De bestaande literatuur wijst echter in de richting van de tegenovergestelde verklaring voor het effect van altruïsme. Een aantal empirische studies laat zien dat het altruïsme van werknemers juist afneemt in plaats van toeneemt in de publieke sector (Blau 1960, Van Maanen 1975, Moynihan en Pandey 2007, De Cooman et al. 2009, en Buurman et al. 2012).

In hoofdstuk 3 hebben we een nauw verwant onderwerp bestudeerd. We hebben onderzocht of werknemers in de publieke sector zichzelf meer altruïstisch en luier schatten dan werknemers in de private sector. Eerst is een theoretisch model geformuleerd waarin werknemers in de publieke sector of in de private sector kunnen werken. In dit model verschillen werknemers in altruïsme (bereidheid om anderen te helpen) en luiheid (kosten van inspanning). Het model voorspelt dat de kans dat een werknemer in de publieke sector werkt groter is wanneer een werknemer altruïstisch is en, afhankelijk van het altruïsme, groter of kleiner is voor een luie werknemer. Altruïstische werknemers hebben een grotere kans om in de publieke sector te werken, omdat de publieke sector de mogelijkheid biedt om bij te dragen aan het welzijn van anderen. Het effect van luiheid op sectorkeuze is indirect. De sectorkeuze van een luie werknemer wordt bepaald door verschillen tussen sectoren in kosten en baten die niet gerelateerd zijn aan de inspanningen van een werknemer, want hard werken is kostbaar voor een luie werknemer. Luiere werknemers hebben een grotere kans om in de publieke sector te werken wanneer zij egoïstisch zijn, omdat luiere werknemers de baten niet gerelateerd aan inspanningen in de publieke sector (zoals het vaste loon) de voorkeur geven boven de hoge beloningen voor inspanning in de private sector. Luiere werknemers hebben daarentegen een kleinere kans om in de publieke sector te werken wanneer zij zeer altruïstisch zijn, want luiere

werknemers hebben relatief lagere baten van de hoge intrinsieke beloningen voor inspanning in de publieke sector. Kort samengevat, ons model voorspelt een negatieve interactie tussen het altruïsme en de luiheid van een werknemer op de kans dat een werknemer in de publieke sector werkt.

We hebben onze voorspellingen empirisch getest met enquêtegegevens over Duitse werknemers uit het German Socio-Economic Panel. In lijn met ons theoretisch model hebben wij gevonden dat werknemers in de publieke sector zich als significant meer altruïstisch en luier schatten dan werknemers in de private sector. We hebben geen bewijs gevonden voor een negatieve interactie tussen altruïsme en luiheid. Gezamenlijk impliceren deze resultaten dat werknemers die zeer altruïstisch en lui zijn de hoogste kans hebben om in de publieke sector te werken. Werknemers die egoïstisch en energiek zijn hebben de laagste kans om in de publieke sector te werken. Een mogelijke verklaring voor het ontbreken van een significant interactie-effect kan zijn dat de bijdrage aan het publieke belang van werknemers in de publieke sector onafhankelijk is van hun inspanningen. Werknemers kunnen bijvoorbeeld het loonverschil tussen een baan in de publieke sector en de private sector al als een bijdrage aan het publieke belang zien.

In een aanvullende analyse hebben we bestudeerd of onze resultaten het gevolg zijn van zelfselectie aan het begin van de carrière van een werknemer of dat onze resultaten meer of minder uitgesproken zijn voor werknemers met meer werkervaring. Er zijn twee mogelijke redenen waarom de werkervaring van werknemers belangrijk kan zijn voor onze analyse. Ten eerste kunnen werknemers de eerste jaren van hun carrière besteden aan 'jobshoppen'. Werknemers aan het begin van hun carrière nemen mogelijk banen aan die niet goed passen bij de voorkeuren en competenties van de werknemer (zie theoretische modellen door Johnson 1978, Jovanovic 1979, en Neal 1999). Ten tweede kunnen de voorkeuren van werknemers ook veranderen naarmate werknemers meer werkervaring opdoen, bijvoorbeeld als gevolg van socialisatie binnen de organisatie (Brewer 2008). Volgens deze redenering zouden onze resultaten sterker of zwakker zijn voor meer ervaren werknemers. Onze resultaten tonen dat het verschil in altruïsme tussen werknemers in de publieke sector en de private sector al aanwezig is aan het begin van de carrière van werknemers en, over

het geheel genomen, blijft dit onveranderd over de gehele carrière. We hebben wel een statistisch significante relatie gevonden tussen luiheid en werkervaring. Aan het begin van de carrière van werknemers bestaan nog geen significante verschillen in luiheid tussen werknemers in de publieke sector en de private sector, maar dit verschil stijgt voor meer ervaren werknemers. Met de huidige gegevens kunnen we echter niet achterhalen of dit het gevolg is van 'jobshoppen' of dat een werknemer zijn voorkeuren aanpast.

Hoofdstuk 4 bestudeert de motivaties van ambtenaren in het bijzonder. Ambtenaren voeren taken uit namens de overheid. De doelstellingen van de overheid zijn beschreven in de missie van de overheid. De missie van de overheid wordt bepaald door gekozen politici. Ambtenaren kunnen verschillen van politici in de regering in hun voorkeur voor een missie voor de overheid. In dit hoofdstuk heb ik empirisch bestudeerd of de missiemotivatie van ambtenaren invloed heeft op de arbeidstevredenheid van ambtenaren. Missiemotivatie kan belangrijk zijn voor arbeidstevredenheid wanneer medewerkers voldoening halen uit het werken aan een missie die in lijn is met hun eigen voorkeur.

De gebruikte data zijn afkomstig uit de Longitudinal Internet Studies for the Social sciences. De steekproef bevat gegevens over Nederlandse werknemers, zoals individuele eigenschappen, details over hun dienstbetrekking en politieke voorkeuren. Informatie over gerapporteerd stemgedrag bij parlementaire verkiezingen is gebruikt om te meten of de missievoorkeuren van een werknemer overeenkomen met die van de regering. Er wordt gesteld dat de missievoorkeuren van een werknemer overeenkomen met die van politici in de regering als een werknemer heeft gestemd op een politieke partij die in de regering heeft plaatsgenomen. Er wordt gesteld dat de missievoorkeuren van een werknemer en de politici in de regering niet overeenkomen als een werknemer heeft gestemd op een politieke partij die na de verkiezingen geen deel uitmaakt van de regering. Om het effect van deze variabele op arbeidstevredenheid te schatten is gebruik gemaakt van het feit dat de missie van de overheid verandert als er een nieuwe overheid aantreedt. Ik heb onderzocht of de arbeidstevredenheid van een ambtenaar verandert nadat de gelijkenis tussen missievoorkeuren van een ambtenaar en regerende politici verandert als gevolg van verkiezingen.

De resultaten laten duidelijk zien dat de missiemotivatie van ambtenaren belangrijk is voor de mate waarin ambtenaren tevreden zijn met hun werk. Ambtenaren geven aan meer tevreden te zijn met hun werk als hun missievoorkeur overeenkomt met die van de regerende politici dan wanneer hun voorkeur niet overeenkomt. Het verschil in arbeidstevredenheid is zowel economisch als statistisch significant. Het effect van een gelijkenis in missievoorkeur is ongeveer van dezelfde omvang als een half uur minder woon-werkreistijd. Een gelijkenis van missievoorkeur heeft geen effect op de arbeidstevredenheid van werknemers buiten de overheidssector.

Daarnaast is onderzocht of het belangrijk is voor de arbeidstevredenheid van een ambtenaar welke andere politieke partijen aantreden in een coalitieregering. In Nederland bestaat de regering uit een coalitie van politieke partijen, dit heeft als gevolg dat politieke partijen vaak compromissen moeten sluiten wanneer zij beleidsplannen maken. In lijn met dit idee tonen de resultaten dat, naast de eerste voorkeur van een ambtenaar (als gemeten door gerapporteerd stemgedrag), het ook belangrijk is welke andere partijen deel uitmaken van een coalitie. Ambtenaren met een positievere houding ten opzichte van de coalitiepartijen zijn significant meer tevreden met hun werk dan ambtenaren met een negatievere houding.

In de laatste studie van dit proefschrift bestuderen mijn co-auteurs en ik een belangrijke dienst die voornamelijk door de publieke sector geleverd wordt, namelijk onderwijs. Goed onderwijs is een topprioriteit voor vele overheden. Het leveren van onderwijs is zeer arbeidsintensief. De prestaties van docenten spelen daarom een cruciale rol bij het leveren van goed onderwijs. In hoofdstuk 5 hebben we bestudeerd of het ontvangen van feedback over prestaties een effect heeft op de prestaties van docenten.

We hebben een veldexperiment uitgevoerd op een grote Nederlandse school voor mbo-onderwijs om het effect van feedback door studenten op de prestaties van docenten te onderzoeken. De prestatie van docenten is gemeten door studenten de docenten te laten beoordelen met behulp van een vragenlijst bestaande uit vragen over negentien onderwerpen over de prestatie van docenten. Nadat we deze informatie hebben verzameld is een feedbacktreatment ingevoerd: een willekeurig gekozen groep docenten kreeg de uitkomsten van de evaluaties door studenten. Het effect

van het ontvangen van feedback is bepaald door alle docenten een jaar later opnieuw te laten evalueren door studenten. We hebben alle docenten bovendien informatie gegeven over de gemiddelde prestatie van de docenten in het team van een docent en we hebben docenten gevraagd om zowel voor als na het ontvangen van feedback een zelfevaluatie te geven van de eigen prestaties.

Onze resultaten tonen dat het ontvangen van feedback geen effect heeft op de toekomstige prestatie van docenten. We hebben een precies geschat nihil gemiddeld effect gevonden. We hebben vervolgens ook onderzocht of de inhoud van de feedback belangrijk is voor het effect van het ontvangen van feedback. Ten eerste hebben we geschat of het effect van feedback afhangt van de mate waarin een docent zijn eigen prestatie kan inschatten. Docenten die een zelfevaluatie geven die overeenkomt met de evaluatie door studenten tonen geen reactie op het ontvangen van feedback. Docenten die leren dat zij zichzelf een stuk positiever beoordelen dan studenten reageren wel op de feedback en presteren in het volgende jaar beter. Vervolgens hebben we ook geschat of het effect van feedback verschilt tussen docenten die leren dat ze beter of slechter presteren dan het gemiddelde van de docenten in hun team. We vonden geen duidelijke relatie tussen het effect van feedback en het verschil tussen de eigen prestatie van een docent en de gemiddelde prestatie van het team.

Leren over prestaties in het verleden kan werknemers motiveren (bijvoorbeeld als werknemers intrinsiek gemotiveerd zijn), maar is ook een manier om werknemers te informeren over voorgaande prestaties. We hebben onderzocht of docenten die feedback ontvangen hun zelfevaluatie aanpassen als zij van de feedback leren dat studenten hen anders beoordelen dan docenten zichzelf beoordelen. We vonden dat docenten hun zelfevaluatie verlagen na het ontvangen van feedback als zij leren dat ze hun eigen prestatie positiever inschatten dan de studenten doen. Dit effect is echter niet langer significant voor docenten die zichzelf veel positiever beoordelen.

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The motivations of public sector employees are important for the performance of public organizations because production is highly labor intensive and, more importantly, because the use of extrinsic incentives is relatively rare in the public sector. The first part of this thesis examines the work motivations of public sector employees. The empirical analysis studies differences in motivations between employees in the public sector and the private sector. In addition, it investigates mission motivation as a source of motivation for government employees. The last part of this thesis examines the use of feedback as an incentive. The effect of students' feedback on the performance of teachers was investigated by conducting a field experiment at a large Dutch school for intermediate vocational education. Both the effect of receiving feedback as well as the relevance of the content of the feedback was investigated.

Robin Zoutenbier (1985) graduated in Economics at Erasmus University Rotterdam in 2010. Afterwards, he joined the Tinbergen Institute as a PhD student at the Department of Economics at Erasmus University Rotterdam. He currently works as a researcher at the CPB Netherlands Bureau for Economic Policy Analysis. A part of this thesis has been published in *Public Administration Review* and another part is forthcoming in *German Economic Review*.