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DISCUSSION PAPER SERIES

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FEBRUARY 2021

## DISCUSSION PAPER SERIES

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# Personality and Public Sector Employment

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FEBRUARY 2021

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## ABSTRACT

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# Personality and Public Sector Employment\*

Using a representative survey combined with register data on long-term labour market outcomes, this paper examines how personality traits predict sorting into public and private sector employment among prime working-age individuals. To gain deeper insights into the dynamic dimensions of the sorting process, we also study the role of personality traits in the decisions to enter or exit public sector work. Our robust results show that public sector workers are more social, while private sector workers exhibit more orderly behaviour. The link between orderliness and sectoral sorting is partly explained by the reduced entry of individuals with high levels of orderliness into public sector employment. High sociability is also financially better rewarded in the public sector, which may implicitly indicate a good fit between this trait and job performance in that sector.

**JEL Classification:** J23, J45

**Keywords:** personality, public sector, private sector, occupational choice

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## 1. INTRODUCTION

Previous studies have shown that personality traits may predict various labour market outcomes, such as earnings and unemployment (see, e.g., Almlund et al., 2011). Additionally, occupational sorting, i.e., the process through which job seekers with divergent characteristics and available jobs are matched in the labour market, has been found to be influenced by personality traits. Previous studies, for example, have found empirical support for Holland's theory of vocational personalities, which predicts that individuals with different combinations of RIASEC (Realistic, Investigative, Artistic, Social, Enterprising, Conventional) characteristics sort themselves into jobs with tasks that match their personality type (Nauta, 2010). Additionally, positive core self-evaluations (Judge et al., 2000) and the Big Five personality traits (openness, conscientiousness, extraversion, agreeableness, neuroticism) have been found to predict sorting into different occupational fields (Ham, Junankar, & Wellis, 2009; John & Thomsen, 2014; Nieken & Strömer, 2010; Sutin & Costa, 2010).

In addition to occupational fields, another key dimension of occupational sorting is sector choice. Previous research has identified notable differences between public and private sector jobs. Although the wage differential in developed countries is typically zero or positive in the public sector's favour, at the upper end of the wage distribution, public sector jobs are typically paid less than those in the private sector (Lucifora & Meurs, 2006; Lausev, 2014).<sup>1</sup> However, compared to jobs in the private sector, public sector jobs are perceived as more secure (e.g., Munnell & Fraenkel, 2013) and more family-friendly (e.g., Feeney & Stritch, 2019). Based on previous research, employees in the public and private sectors also differ along

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<sup>1</sup> Lucifora and Meurs (2006) argue that the wage differentials are smaller in countries where wage formation is more regulated. In line with this argument, public-private sector wage gaps are shown to be negative (private sector wage premium) in Nordic countries (e.g., Albrecht, Björklund & Vroman, 2003; Maczulskij, 2013; Castro, Salto & Steiner, 2013; Christofides & Michael, 2013).

several dimensions. Public sector workers are more often women, have higher education, are more often married and have children and have family members who also work in the public sector (Prümer & Schnabel, 2019; Maczulskij, 2017; Demoussis & Giannakopoulos, 2007; Jovanovic & Lokshin, 2004; Christofides & Pashardes, 2002). Public sector employees have also been characterized as being more risk averse (Buurman, Delfgaauw, Dur et al., 2012; Pfeifer, 2011).

Although occupational sorting may partly explain the sectoral differences in employee characteristics, it is unlikely to be the only contributing factor. In the spirit of Roy's (1951) classic model, individuals arguably choose to work in the sector that maximizes their utility. A central determinant in the utility maximization process is preferences. Because preferences between individuals differ, those who, for example, value a family-friendly work environment or nonmonetary rewards more may self-select into the public sector.<sup>2</sup> On the other hand, the psychology and management literatures have stressed the importance of motivational processes in the work-related sorting process (e.g., Ritz, Brewer & Neumann, 2016; Barrick, Mount & Li, 2013). For example, so-called public service motivation (PSM), which refers to a "set of needs a person possesses related to serving society" (Breugh, Ritz & Alfes, 2018, p. 1428), may explain why some individuals are more likely to work in the public sector (see, e.g., Ritz et al., 2016). One dimension of individual differences that may affect both preferences and motivation, and thus sectoral choice, is personality (e.g., Barrick et al., 2013; Almlund et al., 2011). Several studies have explored how personality traits are related to an individual's

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<sup>2</sup> The existing literature suggests that public sector workers typically value monetary rewards less than private sector workers. However, this does not imply that earnings do not matter to public sector workers. For example, Borjas (2002) has found that workers tend to exit public sector jobs to take private sector jobs at higher wage levels, mainly because the sectoral wage gaps favour the private sector at the upper end of the earnings distribution.

propensity to become an entrepreneur (for meta-analyses, see Brandstätter, 2011; Frese & Gielnik, 2014; Rauch & Frese, 2007; Zhao & Seibert, 2006). There is also some evidence as to how specific personality characteristics such as intolerance of ambiguity, an external locus of control (Bourantas & Papalexandris, 1999), and pro-social behaviour (Buurman, Delfgaauw, Du et al., 2012) are related to public sector employment. However, there is only little evidence on the links between higher-order personality traits and employee selection into the public and private sectors. The few studies that have explored this dimension of occupational sorting have found that women in the public sector tend to be more open (in the Big Five sense) than women in the private sector (León, 2017) and that public sector employees may be more extroverted (Maczulskij, 2017).

We add to this literature by exploring the relationship between personality and employee selection into public and private sector jobs. Using information on eight personality traits (neuroticism, extroversion, sociability, agreeableness, achievement, orderliness, activity, and honesty) combined with longitudinal register information on working careers, we examine how these traits are associated with sorting into public sector employment. A conventional method in this field is to use cross-sectional data to estimate the probability of public sector employment for a sample of public and private sector employees. Then, the characteristics of these two employee groups, such as personality traits in our case, are compared. This type of analysis, however, can be misleading because cross-sectional labour market status may be an inaccurate proxy for workers' long-term careers. Our data cover the years from 1990 to 2009, and thus, we are able to track workers' employment sectors over a 20-year period. To this end, we also utilize the panel dimension of the data to examine whether personality characteristics are associated with entry into and exit from public sector employment.

In the next sections, we first present the linked data used in this study, which combine personality surveys with administrative data on employment outcomes. Next, we carry out our econometric analyses to estimate the association between personality traits and the probability of working in the public sector, along with various heterogeneity and robustness checks. Finally, we conclude the paper by placing our findings into a larger context.

## **2. DATA, VARIABLES, AND METHODS**

### ***2.1 Data sources and the sample***

We use linked data that combine information from two sources: The Older Finnish Twin Cohort Study from the Department of Public Health at the University of Helsinki (the Finnish Cohort Study) and the Finnish Longitudinal Employer-Employee Data (FLEED) from Statistics Finland. These two data sources were linked using unique personal identifiers, and thus, the matching was exact.

The subjects for the Finnish Cohort Study were recruited from the Central Population Registry of Finland in 1975. The initial study target was all same-sex twins born before 1958, with both twins alive in 1975 (Kaprio et al., 1979). A mailed questionnaire was sent to the candidates in 1975 to collect baseline data. The response rate to the 1975 survey was 89% (N = 12,502 twin pairs with responses from both twins, age  $\geq 18$ ). The participants were followed up with twice, once in 1981 (response rate 84%) and once in 1990 (response rate 77%). The 1990 survey was sent solely to a subgroup of persons who were born between 1930 and 1957, which reduced the sample size to approximately one-half of that in the 1981 survey. To maximize the sample size, the main analyses in this paper are carried out using data from the 1981 survey. The Finnish Cohort Study is representative of the overall Finnish population in the same age cohorts (e.g., Maczulskij, 2013).



The FLEED is an annual total population panel, which includes data on working-age individuals in Finland over the 1990-2009 period. The data include information on, e.g., individuals' employment status, earnings, education, industry, and working sector. All information in the FLEED is register-based, which eliminates the risks of nonresponse and measurement error related to self-reported measures.

In total, the 1981 survey matched with the register-based data from the FLEED includes 23,349 individuals. The sample is restricted to working persons, which reduces the number of individuals to 15,908. Restricting the analysis further to individuals for whom we have information on personality traits and other control variables and excluding self-employed individuals from the data reduces the sample size to 12,420. Self-employed individuals were excluded from the analyses because previous research has shown that entrepreneurs' personality traits differ from those of employees (see, e.g., Frese & Gielnik, 2014). The total number of individual-year observations is 152,205. The youngest cohort was 33 years old in 1990 and 50 years old in 2009, while the oldest cohort was 50 years old in 1990. Because individuals in the oldest cohorts retired before 2009, information on the working sector does not cover the whole 20-year period for all individuals. Additionally, periods spent out of the labour force and unemployment spells restrict the number of available observations. On average, individuals are observed in the data for 11 years.

## ***2.2 Variable definitions***

### *2.2.1 Dependent variables*

Our main outcome variable is an indicator for public sector employment, which equals one if an employee worked in the public sector in year  $t$  ( $t = 1990, \dots, 2009$ ) and zero for private sector employees. We also use the following dependent variables in our analyses: 1) an

indicator for public sector stayers (1 = worked only in the public sector; 0 = worked only in the private sector between 1990 and 2009), 2) an indicator for public sector entry (1 = individual switched from the private sector to the public sector between periods  $t-1$  and  $t$ ; 0 = individual worked in the private sector in both periods); 3) an indicator for public sector exit (1 = individual switched from the public sector to the private sector between periods  $t-1$  and  $t$ ; 0 = individual worked in the public sector in both periods), 4) the average share of public sector employment years over the period of 1990-2009, and 5) the logarithm of annual earnings, which were deflated to 2009 euros using the cost-of-living index. Zero earnings are replaced with one before taking the logarithm.

### *2.2.2 Personality measures*

The Finnish Cohort survey includes two domains from the Big Five personality traits: extraversion and neuroticism. The short-form Eysenck Personality Inventory was used to assess extraversion with nine items and neuroticism with ten items in 1981. The total scores are the sums of yes/no (1/0) answers that have been rescaled to range from 1 to 2.

In addition to Big Five extraversion and neuroticism, the survey contains information on 18 statements that describe different dimensions of different personality characteristics. This information was procured in 1981 and 1990. Statements such as ‘unsure – self-confident’ were self-assessed on a five-point scale from 1 to 5 (strongly disagree – strongly agree). The correlations between many of these statements were high, and the Kaiser-Meyer-Olkin measure of sampling adequacy ( $KMO = 0.773$ ) and Bartlett’s test of sphericity ( $\chi^2 = 1.49e + 06$ ,  $df = 153$ ,  $p < 0.001$ ) both support the factorability of the personality matrix. Principal component analysis was therefore applied to obtain latent factors that were measured by the initial variables (Maczulskij & Viinikainen, 2018). Based on Kaiser’s criterion, six factors were

retained, with their eigenvalues varying between 2.67 and 1.60. The cumulative variance explained by these six factors was 70%. The rotated factor loadings are presented in Appendix Table A1.<sup>3</sup>

The factor scores were computed with the following names: sociability, achievement, agreeableness, orderliness, honesty, and activity. The latent factor sociability is highly correlated with the Big Five's extraversion measure ( $r = 0.64$ ), but further analyses showed that this did not affect our results, i.e., the results remained robust when extraversion and sociability were included in the estimation models separately. Two of the personality factors, achievement and orderliness, are related to the Big Five measure of conscientiousness (e.g., Costa & McCrae, 1992; Dudley et al., 2006). The factor honesty, in turn, is related to honesty-humility, which has been proposed as a sixth factor of personality beyond the Big Five traits (e.g., Ashton & Lee, 2005). The honesty-humility personality dimension refers to individual differences in sincerity, fairness, greed avoidance, and modesty. All the personality variables are standardized such that the distributions have a mean of zero and a standard deviation of one.

### *2.2.3 Additional control variables*

As additional control variables, we use sex, age, marital status, an indicator for having at least one underage child, level of education, field of education, and year indicators. Information on each control variable was drawn from the FLEED and was measured in year  $t$  ( $t = 1990, \dots, 2009$ ). Marital status equals one if the person is married and zero otherwise. Similarly, the indicator for having children equals one if the person has at least one underage child.

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<sup>3</sup> The rotation method was specified as "Promax", which provides solutions with correlated components, i.e., oblique solutions (Matsunaga 2010). We also performed the rotated factor loadings using an orthogonal solution, but the results were similar to those reported in this paper.

Information on level and field of education is based on the ISCED (International Standard Classification of Education) classification, and they are measured using 5 and 9 indicators, respectively.

To test for heterogeneity in the results, we examine the association between personality and public sector employment separately for two occupational groups. Occupational information is also drawn from the FLEED and covers the years 1990, 1993, 2000, and 2004-2009. Using these data, we assign individuals to one of two broad occupational categories: white-collar workers (upper-level employees with administrative, managerial, and professional or related occupations, and lower-level employees with administrative and clerical occupations) and blue-collar workers (manual workers). In the robustness analyses, we also use self-reported information on years of education and occupation (10 indicators) that is available in the 1975 Finnish cohort survey.

### ***2.3 Econometric model***

To estimate the links between personality traits and selection into public and private sector employment, we use a pooled logit model. We begin with a specification in which the indicator for public sector employment in year  $t$  is regressed on personality traits and exogenous variables (age, sex, and year indicators), which were also measured in year  $t$ . Then, we augment the model with additional controls for marital status, an indicator variable for having at least one underaged child, and level and field of education. We add these variables as controls, as there is a link between demographic characteristics (such as marital status and having children) and personality traits on the one hand (e.g., Jokela et al., 2009; Lundberg, 2012) and demographic characteristics and the probability of working in the public sector on the other (e.g., Prümer & Schnabel, 2019; Maczulskij, 2017). Indicators for field and level of education

are added to the model to control for occupational segregation between public and private sector jobs. We also use alternative dependent variables (public sector entry and exit) to characterize the stability of public sector employment (see section 3.2).

As a robustness check, we first examine whether the results differ between sexes and between white- and blue-collar workers. We carry out that analysis by estimating interaction models in which interactions with the male (or white-collar employee) indicator and all other control variables are included. This is equivalent to the estimation of separate regressions for each group. Second, to address the extent to which potential changes in personality traits affect our results, we explore whether the results differ if personality traits were measured in 1990 instead of 1981. Third, the augmented baseline model includes time-varying control variables that were obtained after the personality measures were taken (between 1990 and 2009). The advantage of these measures is that they are based on register information and thus do not suffer from potential self-reporting bias. However, it is possible that these traits are influenced by personality and may therefore be considered mediators in our models. For this reason, we replaced the endogenous controls, i.e., years of education and occupational status, taken from the FLEED with their potentially pre-determined self-reported counterparts taken from the 1975 survey. Finally, we exploit the twin dimension of the data to control for shared environmental and genetic factors. This is done by adding family-specific fixed effects in the model and applying a conditional (fixed-effects) logit regression approach for identical twins (e.g., Magnac, 2004). The twin model uses data on individuals for whom we observe his/her co-sibling in year  $t$ . In addition, to be able to exploit the twin dimension of the data for identification, the individual members of the twin pair have to work in different sectors. This decreases the sample size significantly and thus increases the risk of Type II error (i.e., non-rejection of a false null hypothesis). The advantage of the fixed-effects specification is that it provides estimates that are not biased by the omission of unobserved family background and

genetic differences. However, potential measurement error in self-reported personality characteristics combined with the twin-based estimation could yield estimates that are more biased than those from the ordinary cross-sectional analysis at the individual level (e.g., Bound & Solon, 1999).

### **3. RESULTS**

#### ***3.1 Descriptive statistics***

Figure 1 presents the scales and the distributions of the eight standardized personality trait scores. The distributions are right skewed for agreeableness and honesty, while for the other personality traits, the distributions are approximately normal. Appendix Table A2 reports the average scores for the standardized personality measures and the demographic characteristics separately for public and private sector employees. Approximately 37 percent of all wage earners in our data work in the public sector, and shifts between the sectors are quite uncommon (1.3-2.3 percent). The descriptive evidence shows that public sector workers score, on average, higher in sociability, activity, and honesty, while private sector workers score higher in agreeableness and orderliness. Consistent with the previous literature, public sector workers in our sample are older and more educated, and they are more likely to be women and have children. Additionally, the field of education is associated with public-private sector sorting. Public sector employment is more common among those whose field of education is services, health and welfare, or education. Private sector employment, in turn, is more common among individuals whose field of education was classified as “technical” or “generic or unknown”.

[Figure 1 in here]

### 3.2 *Main results*

Table 1 reports the marginal effects of the standardized personality characteristics. The baseline estimates (Column 1) show that higher sociability, achievement, and activity are positively related to public sector employment, whereas for neuroticism and orderliness, the association is reversed. The point estimates imply that a one-standard deviation increase in sociability is associated with a 1.5 percentage-point increase in the probability of public sector employment. Similar increases in neuroticism and orderliness are related to approximately 2-3 percentage point lower probabilities of working in the public sector. Because, on average, the unconditional probability of working in the public sector is 36.6 percent in our data, these estimates represent changes in the probability of working in the public sector of ~4-8 percent.

When the baseline model is augmented with controls for marital status, having children, and level and field of education, only sociability, orderliness, and achievement are statistically significant at conventional levels ( $p < 0.10$ ) (Column 2). Additionally, the point estimates are reduced, and further analyses reveal that these changes are explained by the inclusion of the education variables. The coefficient is 0.012 for sociability ( $p < 0.05$ ), -0.010 for orderliness ( $p < 0.05$ ) and -0.008 for achievement ( $p < 0.10$ ). While the estimates for achievement and activity were positive in the baseline model, they become negative when the level and field of education are controlled for in the analysis. This indicates that education is positively correlated with achievement and activity.

We next examine the extent to which personality is associated with long-term career choices between the public and private sectors. The results in Column 3 (Table 1) show the links between personality traits and public-private sector sorting for the subgroup of individuals who stayed in either the private or the public sector during the whole period from 1990-2009. The results also indicate that within this subgroup, higher sociability and lower achievement

are associated with a higher likelihood of working in the public sector. Additionally, higher honesty is positively associated with public sector employment. Columns 4 and 5 describe how the personality traits are associated with shifts between the private and public sectors. Column 4 shows the associations between personality traits and the probability of public sector entry. Column 5 presents the results from using public sector exit as the dependent variable. Although in Columns 1-3, extraversion does not explain selection into public and private sector jobs, the results in Column 4 show that more extraverted individuals tend to switch from the private sector to the public sector (see also Maczulskij, 2017). Higher orderliness and honesty, in turn, are associated with a decreased likelihood of public sector entry (Column 4). Higher honesty is also linked with a lower probability of public sector exit (Column 5). In terms of effect size, a one-standard deviation change in each of these traits is associated with a 0.1-0.2 percentage-point change in the probability of public sector entry and/or exit, and these estimates translate into 8-9 percent changes in the probabilities.

[Table 1 in here]

### ***3.3 Heterogeneity between genders and occupation groups***

As the first robustness check, we examine whether the association between personality traits and public sector employment choice depends on gender or occupation. Table 2 presents the interaction coefficients, which indicate whether personality-based sorting into public sector employment differs between men and women (Column 1) and between white- and blue-collar



workers (Column 2). Because information on occupational status is available only for the years 1990, 1993, 2000, and 2004-2009, the sample size is smaller in these specifications.<sup>4</sup>

The results in Table 2 (Column 1) suggest that among men, higher levels of orderliness reduce the likelihood of sorting into public sector employment significantly more than among women. There is also some evidence that public sector employment is higher among more extroverted men than among women with the same level of extroversion. We also find that high neuroticism and activity predict sorting into private sector employment more strongly among white-collar employees than among blue-collar workers (Column 2).

[Table 2 in here]

### ***3.4 Other robustness tests***

To further explore the robustness of the results, we first test the generalizability of the factor analysis results using the personality data from the 1990 survey. All the factor loadings and communalities are the same in both years, and the results from this examination are reported in Table 3 (Column 1).<sup>5</sup> Compared to the results in Table 2 (Column 2), the results remain robust for sociability ( $\beta = 0.013$ ,  $p < 0.05$ ) and orderliness ( $\beta = -0.013$ ,  $p < 0.05$ ). We also find

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<sup>4</sup> We also used the observed occupation categories before and after to interpolate the missing values. For example, a worker's occupation group was replaced by "white-collar" for the years 1991-1992 if his/her occupation group was "white-collar" in 1990 and 1993. The imputation of missing data increased our sample size, and the results remained similar to those from our specification using the smaller sample without potential errors.

<sup>5</sup> The correlation coefficients for the latent personality traits between the years 1981 and 1990 were also high, indicating that the personality measures are relatively stable over time (see Maczulskij and Viinikainen, 2018, for more detailed evidence).

that activity is negatively related to public sector employment choice, as already indicated in the analysis for white-collar employees in Table 2.

Second, to describe individuals' tendencies to work in the public sector long-term, we use the average share of public sector employment years over the period 1990-2009 as the outcome variable. The results (Table 3, Column 2) support our earlier finding that higher sociability is associated with a higher probability of public sector employment, whereas in the case of orderliness, the association is reversed.

Column 3 (Table 3) shows the results from a model in which information on education and occupation is drawn from the 1975 survey. Thus, these controls are predetermined with respect to the personality measures. The results provide further support for the finding that sociability is positively associated, and orderliness is negatively associated with public sector employment.

Finally, to control for unobserved family background and genetic effects, we exploited the twin dimension of the data. The results based on identical twins (Table 3, Column 4) show that the estimate for sociability remain statistically significant ( $\beta = 0.071$ ,  $p < 0.01$ ), but the coefficient for orderliness loses its significance. Again, activity is negatively linked to public sector employment ( $\beta = -0.0738$ ,  $p < 0.100$ ).

[Table 3 in here]

### ***3.5 Personality traits and financial rewards in the public and private sectors***

Our results show that individuals with high sociability tend to sort into the public sector, whereas a high level of orderliness is associated with private sector employment. However, whether this kind of sorting implies a "good fit" between personality traits and job

characteristics is unclear. According to standard economic theory, productivity is a central determinant of earnings. Thus, if certain personality traits receive higher financial rewards in one sector, it may be an implicit indicator of a good fit between these traits and job performance in that sector.

To explore whether personality traits are differentially rewarded in the private and public sectors, we estimate a linear model in which the logarithm of annual earnings is regressed on personality traits and other control variables. To explore sectoral differences, the model is augmented with interaction terms between a public sector dummy and all variables in the earnings model. In addition to the controls that we use in our main analyses (e.g., Table 1, Column 2), we also include age squared and annual unemployment months in the model.

Table 4 reports the interaction coefficients for the entire sample and for males and females and for blue-collar and white-collar workers separately. The results show that the return to sociability is 5.1 percent ( $p < 0.05$ ) higher in the public sector than in the private sector for males, whereas for females, the returns to the achievement and activity traits are approximately 2.2 percent ( $p < 0.05$ ) higher in the private sector. The achievement and activity traits are also more highly rewarded in the private sector than in the public sector among white-collar employees.

[Table 4 in here]

#### **4. DISCUSSION AND CONCLUSIONS**

What leads individuals to sort into different occupations and careers has intrigued researchers in many fields. One potential factor that may explain this sorting process is differences in personality traits. Previous research has explored the links between personality traits, entrepreneurial interest, and sorting into different occupations (e.g., Frese & Gielnik, 2014;

Nauta, 2010; Sutin & Costa, 2010). However, there is much less evidence on the role of personality traits in workers' selection into public or private sector jobs. In this paper, we used survey data that were linked to longitudinal administrative records on employment outcomes to explore how personality traits (neuroticism, extroversion, sociability, agreeableness, achievement, orderliness, activity, and honesty) predicted sorting into public and private sector employment. To summarize our findings, our robust results show that individuals with higher sociability are more likely to sort into the public sector, while a higher level of orderliness is associated with a lower probability of public sector employment. The connection between orderliness and private sector employment is partly explained by the lower entry of individuals with high levels of orderliness into the public sector.

Earlier research has strived to explain why personality is linked to occupational and career choices. In the economics literature, personality has been linked to preferences (Almlund et al., 2011), which are key elements of the utility-maximization process. The psychological and management literature, on the other hand, has linked personality traits to motivational processes. Sorting into public sector employment, for example, has been linked to high public service motivation, implying that individuals who possess a high need to serve society are likely to seek public sector jobs (e.g., Ritz et al., 2016). Both the utility-maximization and motivational approaches suggest that individuals seek jobs that match with their traits well, which may also translate into better job performance. This study did not directly assess the potential pathways through which personality traits may affect sorting into public and private sector jobs. The models we estimated were reduced-form models, which modelled the direct link between personality traits and sectoral sorting. However, we did test one potential factor that may implicitly portray the fit between personality traits and sector choice: financial rewards. We found that higher sociability is associated with much higher earnings in the public sector than in the private sector among males. To the extent that earnings reflect productivity,

as standard economic theory suggests, sociability may increase job performance in the public sector. Additionally, the finding that higher sociability is associated with an increased likelihood of long-term career in the public sector implies that this trait matches well with public sector job requirements.

A potential limitation of this study is that although we controlled for field and level of education, occupational sorting may partly explain our results. For example, the prevalence of health care and education occupations is much higher in the public sector than in the private sector. Second, although personality traits were measured before the outcome variables, the possibility of reverse causality cannot be ruled out. Sector choices, which were made before the personality traits were measured, may have shaped personality. However, according to previous research, personality traits in adulthood are relatively stable (e.g., Cobb-Clark & Schurer, 2012; Costa, McCrae & Löckenhoff, 2019), which reduces the possibility of this potential bias. The sectoral selection that occurred before the time the personality traits were measured was potentially captured, at least partly, by the occupational controls that were measured in 1975. These robustness results were in line with our main findings. The strength of this study is the use of longitudinal register information on labour market outcomes, which allowed us to track individuals' career choices over 20 years. Thus, it is unlikely that idiosyncratic components related to cross-sectional data, such as economic fluctuations, drive our results. Additionally, register information eliminates the possibility that personality affects the way individuals assess their employment outcomes. Thus, potential bias stemming from self-reported employment information can be ignored.

In conclusion, the findings of this study show not only that personality traits may affect occupational sorting and the decision to become an entrepreneur, as previous studies have shown, but also that these traits may affect sorting into the public and private sectors. Future studies could explore the mechanisms that explain this sorting further. Additionally,

whether this sorting process implies a “good fit” between the worker and the job characteristics needs to be explored further. Ageing populations and increasing dependency ratios will put significant pressure on public finances in many Western countries in the future. A well-functioning public sector including workers whose traits and qualifications match the job requirements well may alleviate these pressures. Thus, understanding who becomes a public sector worker and whether the traits associated with this sorting process promote workers' performance is an important issue for the future.

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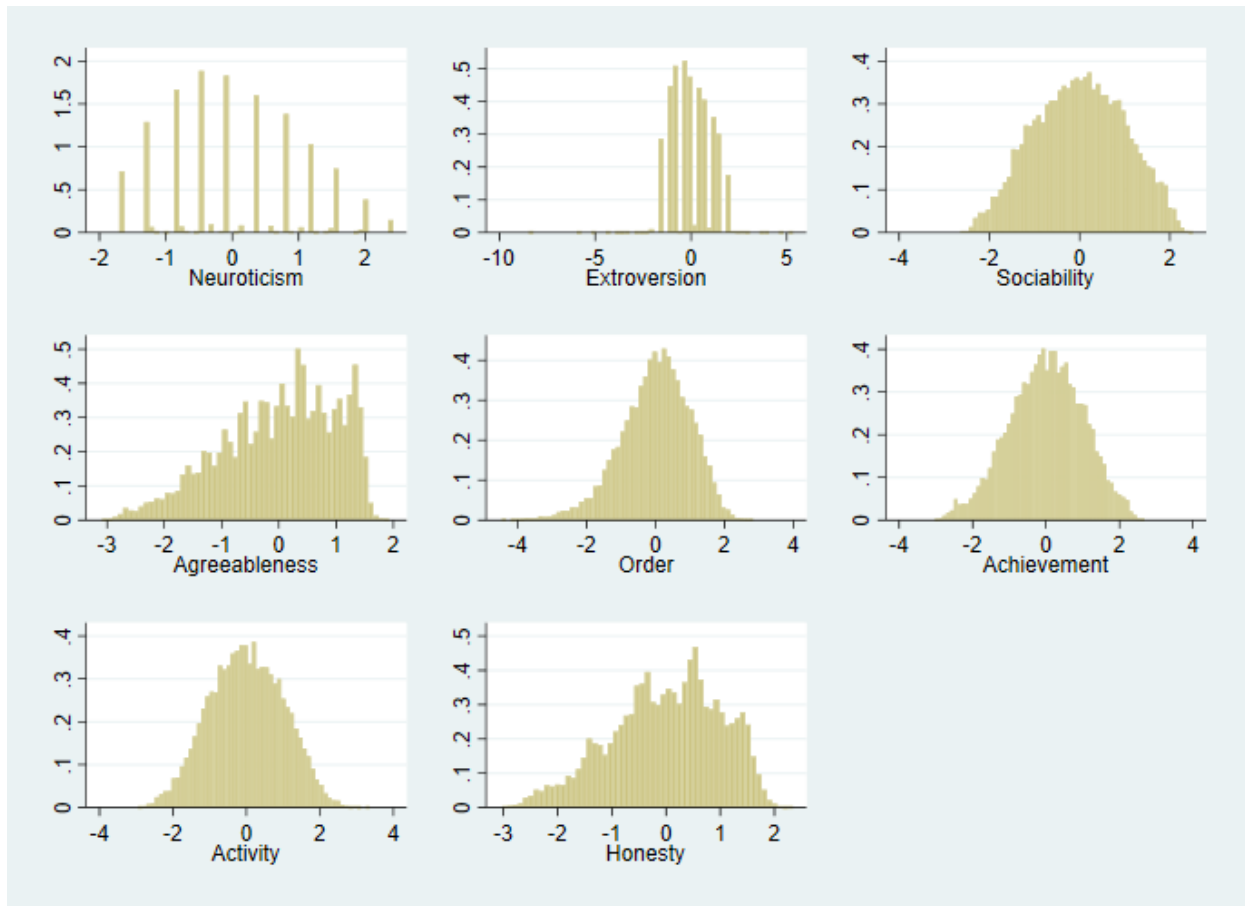
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## FIGURES AND TABLES

**Figure 1.** Distributions of standardized personality trait scores



**Table 1.** Marginal effects of personality characteristics

	Public sector employment (1)	Public sector employment (2)	Public sector employment stability (3)	Public sector entry (4)	Public sector exit (5)
Neuroticism	-0.022 (0.005) ***	-0.003 (0.004)	0.000 (0.005)	0.000 (0.001)	0.000 (0.001)
Extroversion	-0.008 (0.006)	-0.002 (0.005)	-0.002 (0.006)	0.001 (0.001) *	0.001 (0.001)
Sociability	0.015 (0.006) **	0.012 (0.005) **	0.013 (0.005) **	0.000 (0.001)	-0.001 (0.001)
Agreeableness	0.005 (0.005)	-0.002 (0.004)	-0.004 (0.004)	-0.001 (0.001)	-0.000 (0.001)
Orderliness	-0.028 (0.005) ***	-0.010 (0.004) **	-0.007 (0.005)	-0.001 (0.000) **	-0.001 (0.001)
Achievement	0.017 (0.005) ***	-0.008 (0.004) *	-0.010 (0.005) **	0.000 (0.001)	0.001 (0.001)
Activity	0.019 (0.005) ***	-0.003 (0.004)	-0.004 (0.005)	0.000 (0.001)	-0.000 (0.005)
Honesty	0.004 (0.005)	0.001 (0.004)	0.008 (0.004) *	-0.001 (0.000) **	-0.002 (0.001) **
Observations	152,205	152,205	123,358	84,147	49,165
Exogenous controls	Yes	Yes	Yes	Yes	Yes
Endogenous controls	No	Yes	Yes	Yes	Yes
Mean of outcome, in %	36.6%	36.6%	32.6%	1.3%	2.3%

Notes: Standardized coefficients. \*\*\* ( $p < 0.01$ ), \*\* ( $p < 0.05$ ), and \* ( $p < 0.10$ ). The sample covers the years 1990-2009. Dependent variables: public sector employment (columns 1-2), public sector employment for a subgroup of individuals who never switched their working sector from 1990-2009 (column 3), entry into the public sector from the private sector (column 4) and exit from the public sector into the private sector (column 5). Exogenous control variables include gender, age, and year indicators. Endogenous control variables include marital status, having children, education level and field of education. Personality characteristics were measured in 1981, and the other variables were measured in year  $t$ . Standard errors are clustered at the individual level.

**Table 2.** Interaction coefficients between personality characteristics and gender or occupation group

	Public sector employment (1)		Public sector employment (2)
Neuroticism # Male	0.005 (0.009)	Neuroticism # W-C	-0.020 (0.008) **
Extroversion # Male	0.021 (0.011) *	Extroversion # W-C	-0.012 (0.010)
Sociability # Male	0.004 (0.011)	Sociability # W-C	-0.004 (0.009)
Agreeableness # Male	-0.013 (0.008)	Agreeableness # W-C	0.002 (0.007)
Orderliness # Male	-0.016 (0.008) **	Orderliness # W-C	-0.009 (0.008)
Achievement # Male	-0.008 (0.009)	Achievement # W-C	-0.001 (0.008)
Activity # Male	-0.014 (0.008)	Activity # W-C	-0.013 (0.007) *
Honesty # Male	-0.011 (0.008)	Honesty # W-C	-0.002 (0.007)
Observations	152,205	Observations	70,314
Control variables	Yes	Control variables	Yes
Mean of outcome, in %	36.6%	Mean of outcome, in %	36.8%

Notes: Standardized coefficients. \*\* ( $p < 0.05$ ), and \* ( $p < 0.10$ ). The sample covers the years 1990-2009. W-C refers to the indicator for white-collar workers. Dependent variable: public sector employment. Control variables include gender, age, marital status, having children, education level, field of education, year indicators and interaction terms between the male or white-collar indicators and each control variable. Personality characteristics were measured in 1981, and the other variables were measured in year  $t$ . Standard errors are clustered at the individual level.

**Table 3.** Marginal effects of personality characteristics using alternative specifications

	Public sector, personality in 1990 (1)	Average share of public sector employment (2)	Public sector employment, different controls (3)	Public sector, within identical twins (4)
Neuroticism	-0.000 (0.005)	0.000 (0.004)	-0.007 (0.005)	0.029 (0.022)
Extroversion	0.004 (0.006)	-0.003 (0.005)	-0.003 (0.006)	0.027 (0.025)
Sociability	0.013 (0.005) **	0.010 (0.005) **	0.015 (0.005) ***	0.071 (0.025) ***
Agreeableness	-0.002 (0.005)	-0.000 (0.004)	-0.003 (0.004)	-0.033 (0.020) *
Orderliness	-0.013 (0.005) **	-0.009 (0.004) **	-0.011 (0.004) **	0.009 (0.021)
Achievement	-0.003 (0.005)	-0.002 (0.004)	-0.001 (0.005)	-0.001 (0.022)
Activity	-0.011 (0.005) **	-0.002 (0.004)	0.001 (0.004)	-0.038 (0.023) *
Honesty	-0.003 (0.005)	0.003 (0.004)	0.003 (0.004)	0.003 (0.019)
Observations	105,779	10,632	146,806	9,042
Occupation and education in 1975	No	No	Yes	No
Exogenous controls	Yes	Yes	Yes	Yes
Endogenous controls from FLEED	Yes	Yes	No	Yes
Mean of outcome, in %	37.7%	32.9%	36.7%	50%

Notes: Standardized coefficients. \*\*\* ( $p < 0.01$ ), \*\* ( $p < 0.05$ ), and \* ( $p < 0.10$ ). The dependent variable is the average share of public sector employment over 1990-2009 (column 2) or public sector employment (columns 1, 3-4). Exogenous control variables include gender, age and year indicators. Endogenous control variables from the FLEED include marital status, having children, education level and field of education. Latent personality characteristics were measured in 1990 (column 1) or in 1981 (columns 2-4). Other variables were measured in year  $t$ , except for self-reported occupation and years of education, which were measured in 1975 (column 3). Standard errors are clustered at the individual level (columns 1-3) and at the twin pair level (column 4). Estimations were performed using the logit model (columns 1, 3), OLS (column 2) and conditional logit model (column 4).

**Table 4.** Interaction coefficients between personality characteristics and the public sector dummy

	Log (Annual wages) All (1)	Log (Annual wages) Males (2)	Log (Annual wages) Females (3)	Log (Annual wages) Blue-collar (4)	Log (Annual wages) White-collar (5)
Neuroticism # Public	-0.012 (0.009)	-0.007 (0.021)	-0.018 (0.011)	0.006 (0.020)	-0.007 (0.013)
Extroversion # Public	-0.019 (0.011)	-0.012 (0.023)	-0.018 (0.014)	-0.017 (0.024)	-0.008 (0.015)
Sociability # Public	0.015 (0.010)	0.051 (0.022) **	-0.003 (0.012)	0.025 (0.025)	0.011 (0.015)
Agreeableness # Public	0.003 (0.008)	0.029 (0.019)	-0.011 (0.010)	-0.030 (0.020)	0.010 (0.012)
Orderliness # Public	-0.005 (0.008)	0.014 (0.017)	-0.016 (0.010)	0.013 (0.019)	-0.002 (0.011)
Achievement # Public	-0.008 (0.009)	-0.011 (0.019)	-0.022 (0.011) **	-0.013 (0.022)	-0.027 (0.013) **
Activity # Public	-0.015 (0.008) *	-0.012 (0.018)	-0.023 (0.010) **	0.028 (0.024)	-0.045 (0.012) ***
Honesty # Public	0.000 (0.008)	-0.017 (0.016)	0.010 (0.010)	0.008 (0.018)	0.003 (0.012)
Control variables	Yes	Yes	Yes	Yes	Yes
Adj. R <sup>2</sup>	0.24	0.23	0.22	0.19	0.22
Observations	152,205	69,284	82,921	28,994	41,320

Notes: Standardized coefficients. \*\*\* ( $p < 0.01$ ), \*\* ( $p < 0.05$ ), and \* ( $p < 0.10$ ). The sample covers the years 1990-2009. Dependent variable: Log of annual earnings. Control variables include a public sector dummy, gender (columns 1, 4-5), age, age squared, marital status, having children, education level, field of education, year indicators, unemployment months and interaction terms between the public sector indicator and each control variable. Personality characteristics were measured in 1981, and the other variables were measured in year  $t$ . Standard errors are clustered at the individual level. The models were estimated by OLS.



## APPENDIX

**Table A1.** Rotated factor loadings

Variable	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
Talkative	<b>0.730</b>	0.127	-0.026	0.013	-0.070	0.112
Emotional	<b>0.657</b>	0.026	-0.173	-0.161	0.217	-0.015
Open	<b>0.807</b>	0.005	0.050	0.073	0.087	-0.018
Communicative	<b>0.782</b>	-0.009	0.076	0.032	-0.096	-0.029
Determined	0.107	<b>0.635</b>	0.100	0.275	0.039	-0.147
Confident	0.160	<b>0.710</b>	0.090	0.150	-0.031	0.053
Dominant	0.030	<b>0.781</b>	-0.153	-0.098	-0.020	0.034
Ambitious	-0.154	<b>0.614</b>	-0.010	-0.058	0.042	0.402
Amicable	-0.018	-0.025	<b>0.803</b>	0.051	0.015	-0.002
Peaceful	-0.013	-0.001	<b>0.888</b>	-0.016	-0.008	0.010
Calm	0.039	0.037	<b>0.815</b>	-0.083	0.055	-0.010
Quick	0.232	0.075	-0.028	<b>0.659</b>	-0.125	0.172
Studious	-0.017	-0.018	0.031	<b>0.758</b>	0.093	0.082
Prompt	-0.141	0.078	-0.094	<b>0.604</b>	0.147	-0.252
Honest	-0.035	-0.005	0.041	0.127	<b>0.802</b>	0.008
Truthful	0.067	-0.006	0.023	-0.032	<b>0.865</b>	0.032
Active	0.005	0.024	-0.054	0.429	0.024	<b>0.668</b>
Multitasker	0.043	-0.033	0.016	-0.077	0.016	<b>0.800</b>
		<b>Achieve-</b>	<b>Agreeable-</b>	<b>Orderli-</b>		
Factor name	<b>Sociability</b>	<b>ment</b>	<b>ness</b>	<b>ness</b>	<b>Honesty</b>	<b>Activity</b>

Note: High factor loadings are bolded.

**Table A2.** Summary statistics of basic characteristics by sector, 1990-2009

	Public sector	Private sector	t-test
<i>Personality characteristics</i>			
Neuroticism	-0.049	-0.033	0.78
Extroversion	0.035	0.007	1.39
Sociability	0.092	-0.059	7.37 ***
Agreeableness	-0.061	0.035	4.73 ***
Achievement	0.034	0.036	0.48
Orderliness	-0.083	-0.011	3.73 ***
Activity	0.104	0.007	4.92 ***
Honesty	0.009	-0.066	3.72 ***
<i>Demographic characteristics</i>			
Female, dummy	0.76	0.42	37.50 ***
Age	49.0	48.6	4.49 ***
Children, dummy	0.47	0.44	3.63 ***
Married, dummy	0.66	0.66	0.44
Years of education	13.1	11.7	25.59 ***
<i>Education field</i>			
Generic or unknown	0.18	0.36	22.13 ***
Education	0.07	0.00	14.51 ***
Arts and humanities	0.05	0.01	12.04 ***
Business or social sciences	0.18	0.15	4.42 ***
Natural sciences	0.02	0.01	3.35 ***
Technical	0.08	0.34	35.47 ***
Agriculture and forestry	0.02	0.03	3.83 ***
Health and welfare	0.26	0.02	33.32 ***
Services	0.12	0.07	8.77 ***
Number of obs.	37,575	79,251	
Public sector entry	N = 84,147 (0: 83,055, 1: 1,092), 1.3%		
Public sector exit	N = 49,165 (0: 48,034, 1: 1,131), 2.3%		

Notes: Standardized personality scores. Personality trait scores are based on the 1981 survey, and the means of the demographic characteristics are based on the register data covering 1990-2009. The t-tests for equal group means by working sector are clustered at the individual level. Public sector entry/exit: Number of observations from 0/1 indicators and share of mobility between the sectors.