

Article

Job Satisfaction and Implications for Organizational Sustainability: A Resource Efficiency Perspective

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Abstract: This study contributes to the organizational sustainability literature by exploring a methodology for defining and making the notion of employee flourishing at work operational. It applies stochastic frontier methods on British longitudinal data to estimate the maximum job satisfaction that employees can achieve should they utilize their resources efficiently. It offers a new perspective on the notion of social comparisons and extends the literature by demonstrating the scope for organizational intervention in the context of commonly assumed, time invariant variables, which are often thought to be beyond interventionist possibilities. Findings suggest that many British employees fail to reach their job satisfaction potential, reporting satisfaction scores below those of their peers with similar resource endowments. This inefficiency correlates strongly with personality traits. Implications for organizational sustainability policy and practice are discussed.

Keywords: employee well-being; job satisfaction; organizational sustainability; resource efficiency; stochastic frontier analysis



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1. Introduction

Organizations retain a seemingly endless desire to ascertain whether their employees are satisfied with their job. This is not a recent phenomenon. Behavioral science-based attitude testing amongst employees commenced in earnest during the 1920s. Slichter [1] argued that these endeavors were a function of a growing realization of the close relationship between industrial morale and efficiency. Although the popularity of these attitudinal measures fluctuated over time, they have become an established instrument of organizations and development consultants who advise them. Unsurprisingly, therefore, they remain in use today and continue to inform organizations about the impact of their initiatives and behaviors on employees' morale and job satisfaction.

From an organizational perspective, the popularity of measuring employees' job satisfaction is easy to discern. Job satisfaction contributes to a financially sustainable workplace, serves as an important component of sustainable human resource management practices, and supports the goal of developing long-term sustainable organizations [2–4]. These objectives are important and have been validated in several, previous studies. For example, employees who are satisfied with their jobs are more productive [5], less likely to be absent [6], less likely to quit their job [7] and generally known to display a variety of alternative behaviors indicative of affective commitment towards the organization.

An improvement on employees' satisfaction score cards is thus frequently treated as cause for celebration whereas a decline in job satisfaction levels may spell trouble for an organizational leader's bottom line. After all, organizations have grown accustomed to working towards such performance indicators as profit maximization, revenue maximization and market share maximization. Yet, the concomitant question in a job satisfaction context is rarely ever asked: have employees' satisfaction levels with their job been maximized? Put differently, are employees as satisfied as they can be?

This study argues that a plausible reason why employees are not always as satisfied as they can be with their job is because they do not utilize efficiently their personal,

physical, and psychological resources. Building on this assertion, the analytical aim is to investigate whether employees utilize their resources efficiently to move towards their job satisfaction potential. A stochastic frontier analysis is performed on British longitudinal data to estimate a job satisfaction resource efficiency frontier, which defines a quantifiable benchmark for job satisfaction that employees could aspire to. Points on the efficiency frontier represent the maximum job satisfaction that employees can reach should they utilize their resources efficiently, which is based on the highest job satisfaction scores that other employees with similar endowments and characteristics report. The gap between the actual and the maximum job satisfaction (i.e., the job satisfaction deficit/inefficiency) provides a measure of how efficiently employees utilize their resources.

Further analytical explorations then ask whether differences in employees' personality traits, as one of the most prominent determinants in the job satisfaction literature, can explain any job satisfaction inefficiency, and whether and how such possible interlinkages can be managed from an organizational sustainability perspective. The emphasis on personality traits draws on previous work advocating that job satisfaction is to a great extent dispositional in nature [8].

This study makes three important contributions. First, the analysis explores the application of stochastic frontier methods to estimate the maximum job satisfaction that employees can achieve should they utilize their resources efficiently. Second, in doing so, it offers a new theoretical perspective on the notion of social comparisons. Third, drawing on the Personality Psychology literature, it extends the literature by demonstrating the scope for organizational intervention in the context of commonly assumed, time invariant variables, personality traits, which are often thought to be beyond the realm of interventionist possibilities.

The remainder of the article is structured as follows: Section 2 introduces the study's theoretical frame and derives relevant research questions from this literature. Empirical methods and measures are presented in Section 3. The empirical results of the analysis are shared in Section 4, followed by a discussion of theoretical, methodological and practical implications as well as limitations and avenues for future research in Section 5. Section 6 provides some concluding remarks.

2. Theoretical Frame and Research Questions

2.1. Resources and Employee Flourishing

The analysis of whether employees can move towards their job satisfaction potential and why they might not be as happy as they can be at work, is broadly framed within the context of the literature on flourishing. Traced back to Aristotle, the notion of eudaimonia (flourishing) has been central to philosophical debates about ethics, virtues and values. Flourishing has been debated among social scientists and psychologists interested in individual behavior and motivation. According to economists, a flourishing life contains objectively valued goods [9], whereas psychologists argue that flourishing can be achieved when individuals mobilize their unique strengths and virtues for a purpose, which is greater than their own immediate goals [10]. Diener et al. [11] define flourishing as a form of context-free psychological well-being, associated with an optimum human functioning.

Undeniably, organizational leaders do often mention employee flourishing when they discuss sustainability strategies and initiatives to improve employees' job satisfaction and create a happier workforce. There also appears to be a conceptual understanding that employees who flourish are the ones who are willing to engage, to develop their potential, to invest in their skills, and to enjoy trusting working relationships within the organization [12]. However, beyond this level of generic understanding, the concept of flourishing and, specifically, how improved resource utilization could help employees move towards their satisfaction potential remains an under-researched area.

Notable exceptions include studies in the psychological literature, which promote the idea that the efficient use of resources is as important as their availability for predicting employee well-being and for allowing employees to perform at their best. For example,

reflecting on trends in positive psychology to seek a better understanding of human motivation, Wood et al. [13] highlight the importance of employees utilizing their personal, physical, and psychological resources, in order to improve their well-being at work. By making a clear distinction between possessing and using resources, they show that people who make use of their resources report less perceived stress and develop a higher self-esteem, vitality, and positive affect. Bakker & Sanz-Vergel [14] also find a positive association between nurses' self-beliefs and flourishing. The stipulated reason is that such conditions allow nurses to mobilize their personal resources efficiently.

Nevertheless, despite acknowledging the importance of the efficient utilization of resources, only limited attempts have been made in the empirical literature to provide a quantifiable benchmark for employees' job satisfaction (for a notable exception on X-inefficiency and economic satisfaction, see Rojas [15]; in a specific job satisfaction context, see the stochastic frontier analysis by Poggi [16]). This makes it difficult for organizations to assess how efficiently employees utilize their resources, to identify the main factors that explain any specific job satisfaction resource inefficiencies, and thus to pinpoint which kind of intervention could make a discernible difference.

The use of stochastic frontier analysis in this study offers one plausible way for quantifying the notion of a benchmark level of job satisfaction associated with the most efficient use of resources. Gelade & Gilbert [17] advocate the benefits of stochastic frontier (and Data Envelopment Analysis-DEA) methods in organizational research. Specifically, they highlight the fact that such methods are well suited for measuring efficiencies/inefficiencies when inputs and outputs are not easily measurable using a single monetary value metric. However, despite the potential of stochastic frontier analysis to inform empirical research in the organizational arena, its use has been surprisingly limited in a specific job satisfaction context.

By offering a method for estimating the benchmark job satisfaction potential for each employee, stochastic frontier analysis allows for the exploration of factors that can explain the job satisfaction resource inefficiency. This can offer new insights into the factors that affect how efficient employees are in using their personal, physical and psychological resources.

Such factors are also related to organizational climate. For example, Van Woerkom & Meyers [18] stress the importance of employee perceptions of the strengths-based psychological climate within the organization and the developmental opportunities it offers them to use their resources. A positive psychological climate is understood as a catalyst for letting employees flourish, i.e., in the context of this study to be as satisfied as their most satisfied peers with similar endowments and characteristics. In contrast, negative job demands or overly bureaucratic processes pose obstacles for employees to use their strengths and resources to reach their potential [19]. Generally, organizations have control over such factors and pursue initiatives to improve the climate and processes that will allow their workforce to move towards a flourishing state. However, organizations are usually thought to have little control over employees' predisposition to be satisfied with their job. Predispositions are often linked to personality traits, which influence employees' ability to flourish.

2.2. Personality and Job Satisfaction

Personality has been accepted in the literature as a main influencing factor of job satisfaction. Saari & Judge [20] highlight the importance of the relationship between disposition or personality and job satisfaction and its implication for practical applications. Reviewing the evolution of personality research and practice in work organizations from the early 1900s, Schneider [21] discusses the prominence of research in the 1990s that solidified job satisfaction as a personal characteristic, linked to personality. In his review, Schneider confirms the heritability of job satisfaction [22] and the significant correlation of personality with job satisfaction and subjective well-being [23].

In this context, the Big Five Model, also known as the Five-Factor Model, provides a suitable analytical reference point. Compared with other trait theories that attempt to sort individuals into binary categories (for example, introvert or extrovert), the Big Five Model asserts that each trait should be considered on a spectrum. For example, when examining neurotic people, they would not be classified as purely neurotic, but placed on a scale determining their *level* of neuroticism.

The model itself derived from the contributions of many scholars. Gordon Allport and Henry Odbert were amongst the first to arrive at a list of 4500 terms related to personality and respective traits in 1936 [24]. This foundational work allowed other scholars to begin their quest to determine the basic dimensions of personality. Ultimately, McCrae & Costa [25] confirmed the Five-Factor Model's validity across both, instruments and observers, with the five building blocks of the model commonly used today: conscientiousness, agreeableness, neuroticism, openness to experience, and extraversion.

In a meta-analytical study, Judge et al. [26] make the following observations about the facets of the Big-Five personality traits:

Extraversion is generally understood to represent levels of sociability and a propensity to draw enjoyment from interactions with others. Extraverts are likely to seek out social activities and behaviors which help them establish conditions for improving their job satisfaction. In a job context, *Conscientiousness* is usually the most frequently cited personality trait, as it provides linkages with job performance measures and other job-related outcomes. With Conscientious people more likely to appreciate rules and bureaucratic structures, a predisposition towards higher levels of job satisfaction is also predicted [27]. Similarly, but irrespective of context, *Agreeable* people, usually more altruistic and trusting in nature and endowed with pro-social motives, have been shown to be happier in all life situations. A robust empirical correlation between Agreeableness and job satisfaction, even under demanding job conditions, is not an altogether surprising observation, and a similar association is expected in the present study. *Neuroticism*, to take a very different example, refers to insecure and anxious personalities and predictable dissatisfaction with virtually every part of a person's life, including job dissatisfaction. Finally, *Openness to Experience* is arguably the most difficult construct to hypothesize. Certainly, from a theoretical perspective, a significant and generalizable variance in job satisfaction is difficult to substantiate and we would thus expect an Openness-job satisfaction relationship that is statistically insignificant at the conventional levels.

More recent examples in the literature largely confirm these sentiments [28,29], although some discrepancies are evident. For example, Bui [30] reports that extraversion has no significant impact in any group of employees, while the four other traits are significantly linked to job satisfaction.

In general terms, employees with positive personality traits are expected to be able to exploit opportunities and to develop capabilities that will allow them to move towards their job satisfaction potential. In contrast, employees with negative personality traits are likely to be underutilizing their strengths and resources, and therefore to report satisfaction scores below those of their most satisfied peers, based on similar socio-demographic and psychological endowments and characteristics.

Against the above background, the analytical aim in this study explores the following two research questions:

Q1: Do many British employees report job satisfaction scores that are systematically lower than those of their most satisfied peers, based on similar resource endowments and characteristics?

Q2: Do the Big-Five personality traits explain the variation of any job satisfaction resource inefficiency (the gap between actual and potential job satisfaction) across employees?

3. Methods

3.1. Sample

This study looks for evidence about whether employees reach their job satisfaction potential in a longitudinal sample of 24,168 salaried employees in Britain, between 18 and 65 years of age, who were interviewed yearly over the period 1992–2012. The sample is an unbalanced panel of 142,504 person-year observations with each employee observed for 5.9 years on average. To avoid temporal inconsistencies and to be included in the sample an employee needs to be observed for a minimum of 3 years. The sample of 24,168 employees includes 8642 men and 7665 women working in the private sector, and 3009 men and 6565 women working in the public sector.

The data is taken from the British Household Panel Survey (BHPS) and the UK Household Longitudinal Study (UKHLS). The UKHLS replaced the BHPS in 2009. Since 2010, the UKHLS incorporates the BHPS sample [31].

At the level of the individual, both data sets provide rich information in a longitudinal setting and comprise nationally representative samples of households and individuals. Survey participants are selected to represent all areas of the UK, all ages and all educational and social backgrounds. The collection of data occurs annually, and the surveys are freely available from the Economic and Social Data Services at the UK Data Archive for all registered academic faculty, thus supporting analytical replication and further data exploration.

3.2. Measures

3.2.1. Job Satisfaction

Job satisfaction is measured on a Likert scale from 1 to 7, with 1 representing complete dissatisfaction and 7 representing complete satisfaction. The measure is based on responses to the question “All things considered, which number best describes how satisfied or dissatisfied you are with your present job overall?” The validity and reliability of such single-item job satisfaction measures have been confirmed and used extensively in social science and management research [32].

3.2.2. Big-Five Personality Traits

Personality questions are asked in wave 15 of the BHPS and in wave 3 of the UKHLS. Respondents were asked to complete 15 items in the questionnaire, which are used to define the Big-Five personality traits (see Appendix A).

The British Household Panel Survey (BHPS) and the UK Household Longitudinal Study (UKHLS) ask each respondent to rate a set of suggested claims on how they perceive themselves on a 7-point Likert scale, ranging from 1 “does not apply” to 7 “applies perfectly”. Following the approach by Nandi & Nicoletti [33], each personality trait is then measured as the average score of the three measured items.

Table 1 shows the distribution of the Big-Five personality traits in wave 15 of the BHPS and in wave 3 of the UKHLS. The distributions of positive traits (i.e., agreeableness, conscientiousness) tend to be skewed towards the upper end with a larger proportion of respondents reporting high scores for these traits.

In contrast, the distribution of neuroticism, a negative trait, is skewed towards the lower end with most respondents reporting that neuroticism does not apply to them.

The distributions of extraversion and openness to experience are more symmetric. A comparison of the distributions of the big five personality traits in 2005 (BHPS wave 15) and in 2011 (UKHLS wave 3) shows that they are very similar.

Table 1. Distribution of the Big-Five personality traits.

BHPS Wave 15 (2005)										
	Agreeable		Conscientious		Extravert		Neurotic		Open to Experience	
	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent
Does not apply	1	0.02	2	0.04	17	0.31	197	3.61	29	0.53
2	18	0.33	13	0.24	145	2.65	829	15.17	133	2.44
3	148	2.71	155	2.84	750	13.73	1496	27.38	686	12.57
4	749	13.71	804	14.72	1676	30.68	1720	31.48	1689	30.96
5	1744	31.91	1802	32.99	1705	31.22	838	15.34	1836	33.65
6	2183	39.95	1976	36.18	942	17.25	291	5.33	901	16.51
Applies perfectly	622	11.38	710	13.00	227	4.16	93	1.70	182	3.34
TOTAL	5456	100.00	5456	100.00	5456	100.00	5456	100.00	5456	100.00
UKHLS Wave 3 (2011)										
	Agreeable		Conscientious		Extravert		Neurotic		Open to experience	
	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent
Does not apply	7	0.05	2	0.01	127	0.82	803	5.2	139	0.9
2	60	0.39	27	0.17	653	4.23	2833	18.34	546	3.54
3	413	2.67	386	2.50	2056	13.31	4062	26.30	1978	12.82
4	1561	10.11	1642	10.63	4154	26.9	4092	26.50	4440	28.78
5	4076	26.40	4270	27.65	4624	29.94	2371	15.35	4889	31.69
6	6548	42.41	6157	39.87	2799	18.13	952	6.16	2711	17.57
Applies perfectly	2775	17.97	2958	19.16	1029	6.66	330	2.14	724	4.69
TOTAL	154,24	100.00	154,24	100.00	15,424	100.00	15,424	100.00	15,424	100.00

3.2.3. Controls

A multitude of explanatory factors has been linked with job satisfaction, and clearly, we cannot control for all of them in a single study. However, data limitations notwithstanding, the present analysis controls for several factors which have been associated with job satisfaction in previous empirical studies. Research has linked job satisfaction to earnings and extrinsic rewards [34], firm size [35], hours of work [36], and managerial responsibility [37]. Likewise, studies have focused on the influence of a number of demographic factors, including age [38], gender [39], education [40], and marital status and children [41]. The literature also confirms a strong correlation between health and job satisfaction [42]. The definitions and sample means of all variables are shown in Appendix B.

3.2.4. Analysis

To obtain an empirical estimate of an employee's potential job satisfaction, this study uses a stochastic frontier model, which was introduced in the literature by Aigner, Lovell, & Schmidt [43]. In this methodological setting, it is assumed that employees' job satisfaction is determined by observed factors related to their observable personal, demographic and workplace characteristics, and by random, unobservable factors. Stochastic, unobservable factors could limit or augment employees' ability to utilize their strengths and resource endowment to achieve their potential job satisfaction. In this sense, the frontier or benchmark level of job satisfaction is shaped by other employees who are most efficient in utilizing their resources. In essence, therefore, the model allows for the measurement of employees' job satisfaction relative to the most satisfied employees in their peer group, with similar characteristics and resource endowments.

Assuming that y_{it} represents the maximum job satisfaction that employees can achieve at any given time based on their characteristics and resources, then the job satisfaction frontier model can be written as

$$y_{it} = \alpha + X'_{it}b + v_{it} - u_{it} \quad i = 1, \dots, n; t = 1, \dots, T; u_{it} \geq 0, \quad (1)$$

where v_{it} is a random error term and u_{it} is a non-negative error term capturing the bias in job satisfaction when employees are systematically reporting satisfaction scores below those of the most satisfied peers. It is assumed that v_{it} and u_{it} are independently and identically distributed, with mean zero and variance σ_v^2 and σ_u^2 , respectively. X_{it} is a vector of firm and employee characteristics influencing job satisfaction, n is the number of employees in the sample, and T is the number of years employees are observed. By decomposing the error term into the two components v_{it} and u_{it} , the model allows for any deviation from the maximum potential job satisfaction to be attributed to statistical noise as well as to inefficiency in employees' utilization of their resources. Cornwell, Schmidt, & Sickles [44] have developed an approach to estimate the stochastic frontier model of Equation (1) using panel data, which allows the parameters of the model and the job satisfaction resource inefficiency to vary over time.

Following this approach, a job satisfaction frontier is estimated using a time varying maximum likelihood procedure and a translog specification for the job satisfaction function. This allows for the estimation of the job satisfaction resource inefficiency for each employee in each year. To estimate the stochastic frontier model, a translog specification for the job satisfaction function is utilized, with the standard linear homogeneity and symmetry restrictions in all quadratic terms, as follows:

$$\begin{aligned} \ln Y_i = & \alpha_0 + \sum_i a_i \ln N_i + \sum_i \beta_i \ln Z_i + 1/2 \sum_i \sum_j a_{ij} \ln N_i \ln N_j + 1/2 \sum_i \sum_j \beta_{ij} \ln Z_i \ln Z_j \\ & + \sum_i \sum_j \delta_{ij} \ln N_i \ln Z_j + \theta_1 t + \frac{1}{2} \theta_2 t^2 + \sum_i \mu_i t \ln N_i + \sum_i \tau_i t \ln Z_i + u_i + v_i \end{aligned} \quad (2)$$

For clarity, Equation (2) utilizes and adopts various symbols and abbreviations that are common in some, but not necessarily in all disciplines. For example, \ln in the above equation is the notation usually used in physics and engineering to denote the logarithm to base e , also called the natural logarithm. Other terms are arguably more common across disciplines. Σ (sigma), for example, is generally used to denote a sum of multiple terms. The abbreviation term t refers to time and N denotes the sample under study. v_{it} is a random error term and u_{it} is a non-negative error term, as already explained in the above narrative. Z denotes a vector. Variables in the vector Z include earnings, firm size, hours of work, managerial responsibility, age, gender, education, marital status, children and health, all of which have been used as controls in previous job satisfaction regression analyses (see Section 3.2.3).

One advantage of the translog specification is that it is sufficiently flexible and does not impose a priori restrictions on the effects of the various inputs on the dependent variable. Thus, there is no need to test restrictive assumptions as to functional form. The stochastic frontier model (2) is parameterized in terms of the variance parameters $\sigma_\varepsilon^2 = \sigma_u^2 + \sigma_v^2$ and $\lambda = \sigma_u / \sigma_\varepsilon$.

In the second stage of the analysis, a random effects Generalized Least Squares (GLS) model is estimated with the estimated individual job satisfaction resource efficiency score from the first stage as the dependent variable and dummies for whether individuals score highly in each of the Big-Five personality traits as the independent variables. This is to assess whether inefficiencies can be explained by the Big-Five personality traits. Given the documented differences in both job satisfaction and personality between men and women and between public and private sector employees [45], a disaggregated analysis by gender and sector is also performed.

4. Results

Table 2 displays results of the estimation of the stochastic frontier model using the Cornwell-Schmidt-Sickles modified Least Squares Dummy Variable (LSDV) method. The first column reports estimated coefficients based on the full sample. The remaining columns report the results of separate analyses by sector and gender. A general point that emerges from these results is that the choice of using of stochastic frontier estimation rather than a standard OLS regression is fully justified. In all estimations, the higher value of the variance σ_u^2 compared to σ_v^2 is indeed an indication that most of the variance of the composite error term is caused by inefficiency rather than other sources of random variability.

Table 2. Stochastic Frontier Model of job satisfaction (time-varying fixed-effects model, Cornwell-Schmidt-Sickles Modified-LSDV).

	All	Private Sector		Public Sector	
	(1)	Men (2)	Women (3)	Men (4)	Women (5)
Ln(wage)	0.199 ** (0.018)	0.343 ** (0.032)	0.172 ** (0.036)	0.189 ** (0.070)	0.009 (0.043)
Male	1.227 (1.565)				
Private Sector	−0.176 ** (0.023)				
Age	0.088 (0.062)	0.117 (0.100)	0.143 (0.124)	0.016 (0.202)	0.177 (0.148)
(Age) ²	−0.877 (0.755)	−1.595 (1.258)	−1.421 (1.539)	−0.407 (2.375)	−1.987 (1.737)
Married	0.085 * (0.038)	0.175 * (0.069)	0.046 (0.071)	0.226 + (0.129)	0.006 (0.077)
Children	0.002 (0.013)	0.028 (0.020)	0.007 (0.031)	−0.050 (0.037)	−0.016 (0.029)
Higher degree	0.031 (0.076)	0.220 (0.151)	0.235 (0.302)	−0.016 (0.151)	0.092 (0.130)
University degree	0.055 (0.046)	0.102 (0.090)	0.117 (0.141)	0.278 * (0.117)	−0.048 (0.075)
Excellent health	0.205 ** (0.015)	0.163 ** (0.025)	0.225 ** (0.031)	0.305 ** (0.044)	0.187 ** (0.031)
Good health	0.122 ** (0.011)	0.111 ** (0.019)	0.123 ** (0.022)	0.184 ** (0.035)	0.117 ** (0.024)
Large firm	−0.029 (0.022)	0.003 (0.035)	0.059 (0.048)	−0.181 ** (0.058)	−0.033 (0.052)
Hours of work	−0.001 (0.001)	−0.002 (0.002)	−0.000 (0.002)	0.002 (0.004)	−0.006 ** (0.002)
Manager	0.022 (0.018)	0.063 * (0.030)	0.083 * (0.039)	−0.043 (0.050)	−0.051 (0.036)
σ_u	1.362	1.193	1.222	1.187	1.142
σ_v	0.990	0.987	1.031	0.919	0.953
N	142,504	50,727	40,859	16,160	34,758

+ $p < 0.1$; * $p < 0.05$; ** $p < 0.01$.

The estimated coefficients in column (1) confirm the importance of earnings as a main factor exerting a positive influence on job satisfaction ($b = 0.199$, $p < 0.01$). It is also evident that employees in the private sector are generally less satisfied than employees in the public sector ($b = -0.176$, $p < 0.01$). Being married also has a positive effect ($b = 0.085$, $p < 0.05$).

Likewise, excellent or good health is positively associated with job satisfaction ($b = 0.205$, $p < 0.01$; $b = 0.122$, $p < 0.01$). The effects of the remaining variables in column (1), although in the expected direction, are not statistically significant at the conventional levels.

By reference to the results of the disaggregated analysis by gender and sector in columns (2)–(5), it becomes apparent that earnings have a positive and statistically significant effect on job satisfaction in the private sector for both men and women ($b = 0.343$, $p < 0.01$; $b = 0.172$, $p < 0.01$). Men in the public sector also enjoy a boost in job satisfaction by higher earnings ($b = 0.189$, $p < 0.01$).

In contrast, earnings are not a main factor influencing the job satisfaction of women employees in the public sector. The results in column (5) actually suggest that female public sector employees are more concerned about working hours, which have a negative and significant effect on their job satisfaction ($b = -0.006$, $p < 0.01$).

Being married has a positive effect on the job satisfaction of men only and this effect is stronger in the private sector ($b = 0.175$, $p < 0.01$) than in the public sector ($b = 0.226$, $p < 0.10$). University education boosts the job satisfaction of men in the public sector ($b = 0.278$, $p < 0.05$). Having managerial responsibility improves job satisfaction only in the private sector for both men and women ($b = 0.063$, $p < 0.05$; $b = 0.083$, $p < 0.05$). Male public sector employees in large organizations are less satisfied with their jobs than those working in smaller organizations ($b = -0.181$, $p < 0.01$).

Finally, the positive influence of health on job satisfaction is evident across both sectors and genders.

4.1. Efficiencies and Inefficiencies

Based on the results of Table 2, the job satisfaction resource efficiency is then calculated for each employee in the sample compared to the most satisfied among their peers. Specifically, the translog specification allows for the calculation of efficiency scores, defined as e^{-u} , where u is the estimated inefficiency. The efficiency score is always positive and equal to one for full efficiency, i.e., when the individual employee reaches the job satisfaction resource efficiency frontier, and zero for total resource inefficiency.

As shown in Table 3, across both genders and sectors in the data sample, the overall efficiency score is calculated as 71.3 percent. This means that there is considerable scope for improvement, with many employees reporting satisfaction scores of on average around 30 percent below those of the most satisfied employees with similar resources and endowments. For men working in the private sector the average efficiency is 68.6 percent of the most satisfied, while the corresponding score for men in the public sector is 69.0 percent. The efficiency scores for women are generally higher than those for men. For those in the private sector it is 73.7 percent and the average score for female employees in the public sector is 72.4 percent. The reported evidence confirms for the first time that, in answer to research question Q1, many British employees could substantially enhance their satisfaction efficiency.

Table 3. Calculations of employees' job satisfaction efficiencies (e^{-u}).

All	Private Sector		Public Sector	
	Men	Women	Men	Women
0.713	0.686	0.737	0.690	0.724
N: 142,504	N:50,727	N: 40,859	N: 16,160	N: 34,758

4.2. The Role of Personality Traits

In the next stage, the study examines whether the Big-Five personality traits explain variations in the job satisfaction resource inefficiency across employees. In affirmative answer to research question Q2, Table 4 summarizes these results, but some sector and gender differences are evident.

Table 4. Personality and job satisfaction deficit (Random effects GLS regression).

	All	Private Sector		Public Sector	
	(1)	Men (2)	Women (3)	Men (4)	Women (5)
Agreeable	−0.329 ** (0.036)	−0.185 ** (0.048)	−0.031 (0.066)	−0.170 * (0.084)	−0.196 ** (0.073)
Conscientious	−0.097 ** (0.036)	−0.092 + (0.048)	0.009 (0.066)	−0.165+ (0.086)	−0.064 (0.063)
Extravert	−0.211 ** (0.036)	−0.168 ** (0.049)	−0.083 (0.064)	−0.072 (0.082)	−0.172 ** (0.061)
Neurotic	0.218 ** (0.029)	0.468 ** (0.039)	0.228 ** (0.055)	0.622 ** (0.063)	0.397 ** (0.051)
Open to experience	0.381 ** (0.036)	0.167 ** (0.055)	−0.018 (0.053)	0.060 (0.104)	0.177 ** (0.061)
N	142,504	50,727	40,859	16,160	34,758

Notes: Robust standard errors, adjusted for clustering in individuals; + $p < 0.1$; * $p < 0.05$; ** $p < 0.01$.

As the coefficients in column (1) suggest, employees who score highly in agreeableness, conscientiousness and extraversion are less likely to be inefficient in converting their resource endowments into job satisfaction ($b = -0.329$, $p < 0.01$; $b = -0.097$, $p < 0.01$; ($b = -0.211$, $p < 0.01$). The opposite is true for employees who are scoring highly in neuroticism or openness to experience ($b = 0.218$, $p < 0.01$; $b = 0.381$, $p < 0.01$). Of those five personality traits, neuroticism is consistently and positively associated with resource inefficiency across both sectors and genders. Moreover, the effect of neuroticism on inefficiency is much stronger for men than for women both, in the private sector ($b = 0.468$, $p < 0.01$; $b = 0.228$, $p < 0.01$) and in the public sector ($b = 0.622$, $p < 0.01$; $b = 0.397$, $p < 0.01$). Agreeableness reduces the job satisfaction resource inefficiency for men in the private sector ($b = -0.185$, $p < 0.01$), but not for women. Agreeableness is also negatively associated with the inefficiency in the public sector, for both men ($b = -0.170$, $p < 0.05$) and women ($b = -0.196$, $p < 0.01$). Conscientiousness only exerts a weak effect on inefficiency for male employees in the private and public sector ($b = -0.092$, $p < 0.10$; $b = -0.165$, $p < 0.10$). Extraversion reduces the resource inefficiency for men in the private sector ($b = -0.168$, $p < 0.01$) and for women in the public sector ($b = -0.172$, $p < 0.01$). Finally, openness to experience increases inefficiency for men in the private sector ($b = 0.167$, $p < 0.01$) and for women in the public sector ($b = 0.177$, $p < 0.01$).

5. Discussion

The purpose of this study was to investigate whether employees utilize their resource endowment efficiently so that they flourish at work. Conceptually, the notion of flourishing at work is associated with maximized job satisfaction. Therefore, in this context, employees flourish when they reach their job satisfaction potential, based on the benchmark level of job satisfaction that their peers, with similar endowments and resources, have achieved. Empirical findings suggest that many employees are less satisfied with their jobs compared to the most satisfied among their peer group, i.e., they do not reach their job satisfaction potential. Arguably, such inefficiency is evidence that employees do not utilize their resources efficiently. The level of resource efficiency is also generally higher for women than for men, which is suggestive of gender differences in how men and women utilize their resources. Or it might simply be that women pay more attention to different resources than men do. Somewhat surprisingly, the analysis did not uncover any striking differences in efficiency levels between private and public sectors, despite several previous studies explicitly distinguishing and comparing job satisfaction measures between private and public sector domains [46–48].

The second analytical stage revealed that the Big-Five personality traits explain the variation in inefficiency across employees. Employees scoring higher on Extraversion and Agreeableness, and those scoring lower on Neuroticism, are more likely to be satisfied with their jobs, although some gender and sector differences are evident.

5.1. Theoretical and Methodological Implications

This study contributes to the organizational sustainability literature by exploring a methodology for defining and making the notion of employee flourishing at work operational. Using stochastic frontier analysis, an estimation of a quantifiable benchmark level of job satisfaction is performed that employees can aspire to. This operationalization has the advantage that it is based on the level of satisfaction that employees' peers were able to achieve already, with similar resource endowments. Therefore, it offers employees a concrete and realistic benchmark for comparison. In this respect, the study introduces a new perspective on social comparisons at work. Existing empirical work on social comparisons defines the comparison group to include others with similar characteristics (e.g., same age, same education) [49–51]. Nevertheless, identifying the comparison group, against whom employees compare themselves, remains a vexed issue in the literature. Estimating job satisfaction resource efficiencies offers a more general way to identify the comparison group. Simply put, the stochastic frontier analysis identifies employees' comparison group as the most satisfied with their jobs among those employees with similar strengths and resources. The benchmark thus becomes the comparison level of job satisfaction, defined as the upper bound that could be achieved given employees' strengths and resources.

The study also contributes to the literature by offering a fresh perspective on the distinction between available vs. efficiently utilized resources. Much of the existing empirical work on identifying the antecedents of job satisfaction is based on the assumption that such antecedents are inputs that influence job satisfaction as an output variable. In this case, employees are predicted to reach a level of job satisfaction, which is determined by the availability of inputs. However, available resources alone are not necessarily a good predictor of job satisfaction. This point has attracted only limited attention in the existing literature. By estimating the gap between the actual and potential job satisfaction, this study emphasizes the fact that the efficient utilization of resources is as important as their availability for employees to be as satisfied as they can be. This could potentially represent a paradigm shift, which is underpinned by a eudaimonic approach to employee well-being, with the main emphasis placed on allowing employees to reach their potential. Job satisfaction research to date has been predominantly driven by a hedonic view of employee well-being, which focuses on employees' day-to-day, moment-to-moment experiences.

Finally, findings on the role of personality in explaining differences in the job satisfaction resource inefficiency across employees reinforce the argument made in previous studies that job satisfaction is largely dispositional in nature.

5.2. Practical Implications

This study has important implications for organizational sustainability policy and practice. While job satisfaction and other employee well-being and engagement measures have been high on the agenda in most organizations [52–54], the distinction between the hedonic and the eudaimonic approaches has been greatly ignored. Many initiatives to boost employee job satisfaction often overemphasize improvements in employees' hedonic, day-to-day experiences at work. As a result, the importance of employees being able to reach their potential and to flourish is often sidelined.

Naturally, there is recognition that employees' moods and emotions fluctuate on a daily basis because of various workplace stimuli, interactions, and job demands [55,56]. However, day-to-day well-being shocks do not necessarily influence employees' important decisions about their current employment (e.g., to invest in training or to seek alternative employment). In contrast, employees base their decisions on a more holistic evaluation of whether they are able to reach their potential. This is consistent with Kahneman, Wakker,

& Sarin [57] who make the distinction between experienced utility, i.e., the moment-to-moment, instantaneous level of pleasure or pain, and decision utility, which is based on a holistic evaluation of wide-ranging circumstances.

If the distinction is drawn between hedonic and eudaimonic well-being, then it is arguably even more pressing for organizations to prioritize those interventions that would enable employees to move towards their job satisfaction potential. This requires identifying the current position of employees compared to their benchmark (potential). In the context of the present analysis, such benchmarks are defined by reference to their peers, with the same characteristics and resources, who are the most satisfied. If employees are systematically less satisfied than their peers, then it is necessary to identify the reasons for such a systematic job satisfaction deficit.

A large part of this analysis was about the role of personality in explaining employees' job satisfaction resource inefficiencies. The empirical findings suggest that employees with certain personality traits are better at utilizing their resources that allows them to reach their job satisfaction potential.

Of course, one must be mindful about skepticism, which suggests that organizations may not have control over whether employees reach their potential. After all, previous research suggests that Big-Five personality traits are stable for working-age adults and even adverse life events do not appear to alter personality traits in a significant and economically meaningful manner [58]. However, even if personality is predetermined and largely time invariant, 'managing' personality is still possible and necessary.

One way to manage personality is at the point of entry (recruitment and selection), ensuring that future employees possess the personality traits that will enable them to utilize efficiently their strengths and resources in their future role. Although organizations cannot directly influence the personalities of their employees, they could encourage behaviors, associated with certain personality traits, which are consistent with employees' pursuit to reach their potential. Similarly, a known mismatch between personality and a eudaimonic state can be avoided. For example, it is commonly accepted that people characterized by neurotic traits have the tendency to be anxious and easily disappointed, with foreseeable consequences for their job satisfaction scores. They can thus be easily isolated and may become involved in work situations that impact negatively on their well-being. Conversely, organizations could conceivably pursue an 'avoidance strategy' that could potentially realize eudaimonia by utilizing such tactics as the avoidance of socially demanding, complex and stressful higher-level jobs (e.g., teamwork roles in high-pressure work environments) for which neurotic employees appear to be particularly ill suited.

5.3. Limitations and Future Research

The emphasis in this study has been on maximized job satisfaction, referred to as a proxy for the notion of flourishing at work. This is in line with a long-standing research stream that portrays job satisfaction as a catch-all variable, capturing employees' holistic evaluation of their working conditions and providing a summative variety of job satisfaction facets [59]. Nevertheless, analytical endeavors could be extended to consider alternative measures of flourishing at work, which could include life satisfaction or multi-item flourishing scales developed in psychological research [60].

In the empirical analysis, personality traits were treated as time invariant. Although the majority of respondents in the data sample reported the same or very little change in their personality traits, a proportion of respondents reported some change. Therefore, treating personality as a fixed variable is a limiting assumption. Yet, comfort can be taken from the fact that the literature on the stability of personality over the life-cycle has produced rather mixed results. For example, there is evidence in the Personality Psychology literature suggesting that personality can change due to factors other than intrinsic maturation [61,62]. It follows that the present analysis could be extended in future works to consider personality as a time varying variable, should more detailed data sets on personality traits become available.

Potential gender and sector differences were explored on whether employees are as satisfied with their jobs as they can be, more by way of a robustness check. In this sense, the study only scratched the surface of a potentially fruitful line of inquiry on gender and sector differences in how employees utilize their personal, physical, and psychological resources. Developing a sound theoretical framework for exploring such differences in future empirical analyses is a promising way to develop this research further. Within this context, a more disaggregated analysis by refined occupational categories may also provide a sharper focus for identifying the psychological mechanisms that explain how employees utilize their resources in order to flourish at work.

It should also be noted that the time frame under study was somewhat arbitrary. At the commencement of the analysis, it was originally determined by the availability of suitable data of interest, including multiple controls known from the literature to impact the level of workers' job satisfaction. Admittedly, additional waves of the UKHLS data source and similar surveys in different jurisdictions (e.g., the German Socio-Economic Panel) continue to be released. The present study contends that data capturing observations that span across two decades provides sufficient depth and breadth to explore the proposed stochastic frontier methodology under robust, longitudinal conditions. Nevertheless, scholars are encouraged, for the purpose of comparison and validation in future studies, to utilize the best data available to them, in Britain and elsewhere, to examine the present findings, and compare and contrast them with their own.

Finally, and in more general terms, the question of whether employees are as satisfied with their job as they can be presupposes that the level of a complex and intangible metric such as employees' job satisfaction can actually be maximized. At first sight, such an assumption is arguably fraught with difficulty. After all, the burgeoning job satisfaction literature presents a multiplicity of antecedents that can influence employees' job satisfaction scores, thus speaking to the requirement to potentially capture all these factors to arrive at the highest possible level of employees' job satisfaction. As the number of alternative antecedents to employees' job satisfaction increases, so does the difficulty of adequately assessing every alternative antecedent and comparing the latter to every other alternative antecedent.

To this end, the challenge with the present study's maximizing objective is not that we aim for the highest job satisfaction levels, but rather that high levels are being targeted with seemingly limitless choice alternatives. To make the notion of maximized job satisfaction meaningful, it is thus advisable to treat the maximization objective as a constrained measure. Examining ways to improve job satisfaction scores as an analytical endeavor has always been subject to the personal, physical, and psychological resources that are captured by data at the analyst's disposal. Therefore, maximized job satisfaction in this study is seen as reaching for an employee's job satisfaction potential, albeit with the explicit recognition that the analysis cannot control for all conceivable influencing factors in a single study.

It is in this sense that the application of a stochastic frontier analysis is examined in an exploratory rather than a finite empirical setting. It follows that future studies are encouraged to utilize alternative personal, physical, and psychological resources and perhaps also to extend the examination beyond Britain and explore the resource efficiency perspective from a different geo-political vantage point.

6. Conclusions

Given the ongoing interest in the collection of employees' job satisfaction data to support the goal of organizational sustainability, this study asked the question: are employees as satisfied as they can be? The answer is that this is not necessarily the case. The empirical analysis found that British employees are reporting job satisfaction scores, which are on average around 30 percent below those of their most satisfied peers. This is an intriguing finding, which raises the issue of why certain employees are consistently less satisfied with their jobs than their peers with similar personal, physical, and psychological resources. One explanation is that these employees are not as efficient in utilizing their

resource endowment as their more satisfied peers. As the empirical findings suggest, how efficiently employees use their resources is partly due to personality differences.

Finding out whether employees are as satisfied at work as they can be is important. It is well-established in the literature that happy employees, who are satisfied with their jobs, make a positive contribution to organizational sustainability objectives. The present study sheds additional light in a new direction by focusing not merely on what determines job satisfaction per se, but on whether employees can reach their job satisfaction potential and whether and how organizations can assist in accomplishing this task. Therefore, despite acknowledged limitations, this study offers a new perspective that should help shift the emphasis of organizational initiatives, including endeavors towards plans that avoid mismatches between personality and a work-related eudaimonic state.

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Data Availability Statement: The data used in this study is freely available from the Economic and Social Data Services at the UK Data Archive for all registered academic faculty.

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Appendix A

The 15 items used to define the Big Five personality traits.

Agreeableness

'I see myself as someone who is sometimes rude to others' (reversed)

'I see myself as someone who has a forgiving nature'

'I see myself as someone who is considerate and kind to almost everyone'

Conscientiousness

'I see myself as someone who does a thorough job'

'I see myself as someone who tends to be lazy' (reversed)

'I see myself as someone who does things efficiently'

Extraversion

'I see myself as someone who is talkative'

'I see myself as someone who is outgoing, sociable'

'I see myself as someone who is reserved' (reversed)

Neuroticism

'I see myself as someone who worries a lot'

'I see myself as someone who gets nervously easily'

'I see myself as someone who is relaxed, handles stress well' (reversed)

Openness to experience

'I see myself as someone who is original, comes up with new ideas'

'I see myself as someone who values artistic, aesthetic experiences'

'I see myself as someone who has an active imagination'.

Appendix B

Table A1. Variable definitions and sample means.

Variable	Definition	Private Sector		Public Sector	
		Men	Women	Men	Women
Job satisfaction	Self-reported job satisfaction, Likert scale 1 (completely dissatisfied) to 7 (completely satisfied)	5.193	5.388	5.265	5.455
Ln(wage)	Log of hourly real wage; $\text{Ln}(\text{wage}) = [((\text{pre-tax monthly pay}) \times 12) / 52] / (\text{weekly hours of work})$	2.342	2.013	2.505	2.316
Hours of work	Usual weekly hours of work	39.422	30.247	37.164	29.905
Age	Age in years	39.507	39.081	42.202	42.421
Married	Dummy variable: 1 for married; 0 for non-married	0.019	0.0304	0.017	0.031
Children	Number of own children in the household	0.737	0.751	0.773	0.879
Higher degree	Dummy variable: 1 for higher university degree; 0 otherwise	0.025	0.012	0.063	0.040
University degree	Dummy variable: 1 for first university degree; 0 otherwise	0.085	0.059	0.148	0.139
Excellent health	Dummy variable: 1 for excellent health; 0 otherwise	0.249	0.220	0.265	0.244
Good health	Dummy variable: 1 for good health; 0 otherwise	0.456	0.457	0.442	0.452
Large firm	Dummy variable: 1 for large firm (>500 employees); 0 otherwise	0.075	0.057	0.089	0.061
Manager	Dummy variable: 1 for manager; 0 otherwise	0.276	0.180	0.304	0.207
Agreeable	Dummy variable: 1 if agreeableness score > median agreeableness score in the sample; 0 otherwise	0.414	0.476	0.487	0.561
Conscientious	Dummy variable: 1 if conscientiousness score > median conscientiousness score in the sample; 0 otherwise	0.425	0.473	0.458	0.539
Extravert	Dummy variable: 1 if extraversion score > median extraversion score in the sample; 0 otherwise	0.448	0.485	0.472	0.542
Neurotic	Dummy variable: 1 if neuroticism score > median neuroticism score in the sample; 0 otherwise	0.434	0.502	0.496	0.568
Open to Experience	Dummy variable: 1 if openness score > median openness score in the sample; 0 otherwise	0.480	0.440	0.557	0.536
N		50,727	40,859	16,160	34,758

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