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Employment Flexibility and Job Security as Determinants of Job Satisfaction: The Case of Polish Knowledge Workers

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Abstract A number of empirical studies have shown a positive influence of employment stability on job satisfaction. Employment stability, usually measured by the type of contract an individual has, may affect one's job satisfaction directly, as well as through its impact on other relative variables, such as job security, since a stable position seems to bring individuals a sense of security. The aim of our research is to investigate the relationships between job security, employment stability and job satisfaction of workers in Poland. In the study, we strive to show how these factors impact knowledge workers and other workers differently. In order to conduct analysis, we propose two logistic models, separate for these two groups, with job satisfaction as a dependent variable and type of contract and three items denoting different dimensions of job insecurity: an insecure source of income, too many duties to cope with and being treated unjustly at the workplace, as independent variables. The robustness of the models has been defended by the introduction of the time dimension. The results show that job insecurity is the most influential factor in the model of job satisfaction for all employees. However, this impact differs depending on the employment arrangements. Flexible workers are much more vulnerable to job insecurities in terms of job satisfaction. Another finding is that the job satisfaction of knowledge workers is more influenced by job security.

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1 Introduction

Contrary to common opinion, the numerously replicated empirical studies show no direct influence of job satisfaction on productivity (Judge et al. 2001; Locke 1976; Wright and Cropanzano 2000). However, job satisfaction remains an important and influential factor that needs to be studied and analysed.

First of all, job satisfaction is related to life satisfaction. Although some research shows otherwise (Rode 2004), there seems to be a reciprocal relationship between job satisfaction and life satisfaction (Judge and Watanabe 1993; Rain 1991). That is to say that individuals with higher life satisfaction are more satisfied with their jobs, and persons satisfied with their jobs will be in turn more satisfied with life in general.

Furthermore, job satisfaction, or more precisely job dissatisfaction, may have adverse impacts on individuals' physical and mental health and attitudes. The consequences of job dissatisfaction may also include absenteeism and grievances (Locke 1976). Some studies suggest that the residual of the job satisfaction equation represents individuals' propensity to quit their present job position (Lévy-Garboua et al. 2007). This suggests that analysis of this variable may help to get insights into workers' behaviour.

Analysis of job satisfaction includes not only its consequences, but also its causes. Over the years, an extensive number of variables have been proposed as potential determinants of job satisfaction (e.g. Herzberg 1964; Locke 1976; Clark 1997; Clark et al. 1996). Among others, the growing body of research shows a prominent influence of job security (e.g. Origo and Pagani 2009; Fullerton et al. 2011). In times of precarity and uncertainty, job security has become a sought after job feature.

On the other hand, the dynamic changes present in labour markets require flexible solutions, for example flexible employment contracts, often associated with a precarious, insecure job situation—the opposite of job security. In recent years, as an answer to these two conflicting demands, the concept of *flexicurity* has emerged. Flexicurity is a policy that strives to enhance labour market flexibility, ensuring at the same time workers' employment and social security (European Commission 2007). The question is—is flexicurity a feasible policy and if so, is it better, from the point of view of workers, than rigid, secure employment?

The paper investigates the relationships between job security, employment stability and job satisfaction of workers in Poland—the country with the highest percentage of temporary contracts in Europe (European Commission 2013b) and with one of the highest percentage of self-employed persons (European Commission 2013a). In particular, in the analysis we strive to explore how workers with different employment contracts are influenced by job insecurity in terms of job satisfaction. The group of main interest are knowledge workers. Analyses are conducted for this group and compared with the results for the rest of the workers.

It has been proven (e.g. Burón 2007) that the influence of predictors of job satisfaction varies between different groups of workers. Therefore, it is worth disaggregating the analysis of job satisfaction to subgroups of workforce and focusing research on a specific group. Knowledge sector is a relatively new, yet dynamically expanding, element of the

economy. Thus, it seems to be of growing importance to present an analysis focused on the interplay of employment flexibility and job security and how it impacts the job satisfaction of this particular group. Yet, the existing literature on the subject of job satisfaction of knowledge workers—especially in the context of Eastern European countries—remains scant, and none focuses on the subject of flexicurity. The presented paper contributes to the existing body of research by explaining the relationships between employment flexibility, job security and job satisfaction among knowledge workers.

The remainder of the paper is organized as follows. Section 2 presents the theoretical background of the analysis together with the theoretical model. In Sect. 3 research hypothesis are presented. Section 4 describes the data used in the analysis. Section 5 reports empirical model and Sect. 6 gives conclusions.

2 Job Satisfaction: Theoretical Background

2.1 The Discrepancy Model of Job Satisfaction

Job satisfaction has been widely studied for many years. Although the tradition of analysing job satisfaction as such began in the 1930s, the study of attitudes and their influence on productivity goes back to the beginning of the twentieth century (Locke 1976). Since then various theories concerning the meaning of job satisfaction as well as different groups of factors influencing it have been developed.

The trends in the literature have varied throughout the years, giving superiority to different determinants of job satisfaction. Many types of factors, from physical working conditions, such as noise or illumination, through social relations between co-workers and management, and finally to work itself (i.e. the challenge and achievement it brings) have been thought to be the most significant determinants of job satisfaction.

Some theories, such as Herzberg's Motivator Hygiene Theory, divide determinants into psychological factors called *motivators*, which bring job satisfaction, such as achievement, personal growth or recognition, and physical factors, called *hygiene*, which cause job dissatisfaction (Herzberg 1964). Although Herzberg's theory has been acknowledged for stressing the importance of psychological aspects of work, there is little evidence supporting the theory of the dichotomy of the physical and psychological factors (Hackman and Oldham 1976), while some empirical evidence even proves the opposite (Locke 1976).

An appealing view on job satisfaction is the discrepancy theory proposed by Locke (1976). According to his definition, job satisfaction is a: "pleasurable emotional state resulting from the perception of one's job as fulfilling or allowing the fulfilment of one's important job values, providing these values are compatible with one's needs. (Values refer to what one considers beneficial, whereas needs are conditions actually required for one's well-being.)" (Locke 1976, p. 1342). This theory treats job satisfaction as a measure of the gap between an individual's ideal job, where all his or her values and needs are fulfilled, and the actual job position that he or she has. The bigger the discrepancy between the reference and the real job is, the less job satisfaction an individual achieves.

An important aspect of this theory is that individuals differ in valuing various job facets, giving them different importance. The effect of the discrepancy between the ideal level of a certain job aspect (e.g. number of working hours) and its actual level on job satisfaction is larger if that aspect is more important for an individual. Also, the influence of discrepancies within job facets on job satisfaction may differ in nature. That is to say that the relationship between some values and job satisfaction is linear. A good example of this

kind of value is pay. Usually, the bigger one's salary, *ceteris paribus*, the more satisfied he or she is. On the other hand, it is claimed that for some job facets the relationship with job satisfaction is bell-shaped. The bigger the discrepancy between the ideal scenario and reality, no matter if it is a deficit or surplus, the lower the job satisfaction (Locke 1969).

In the discrepancy theory, values are explicitly separated from expectations. Expectations are what one thinks will occur in the future. These might, but not necessarily do coincide with what is wanted (Locke 1969). A concept similar to the discrepancy theory, but one that focuses rather on expectations is the experienced preference theory (Lévy-Garboua and Montmarquette 2004). This takes past employment as a job of reference rather than the ideal job. In this paper we combine the two approaches. As in the experienced preference theory, we allow expectations to be a factor shaping the reference levels of job characteristics. However, we do not require expectations to be shaped by past job experience. Our approach coincides with the discrepancy theory, in the sense that the level of job reference is a theoretical concept. The discrepancy theory, however, refers to an ideal job, whereas we refer to an *expected* job. For simplicity, we will refer to our approach as to the discrepancy theory.

2.2 Theoretical Model

The formal notation of the discrepancy theory is as follows (Burón 2007). Let us assume that the employment e of individual i can be described by K job characteristics:

$$\mathbf{e_i} = \{z_{ik}\}, \quad k = 1, \ldots, K$$

Similarly, the job expectations of individual i ($\mathbf{e_i^*}$) can be characterized by the expected values of K job facets:

$$\mathbf{e_i^*} = \{z_{ik}^*\}, \quad k = 1, \ldots, K$$

As explained before, according to the discrepancy theory, job satisfaction is the function of the *expected* job and *actual* job,

$$JS_i = f(\mathbf{e_i}, \mathbf{e_i^*})$$

In particular, this can be presented as the difference between the utility an individual gets (or expects to get) from real and hypothetical jobs:

$$JS_i = U(\mathbf{e_i}) - U(\mathbf{e_i^*}),$$

where utility function $U(\cdot)$ has a linear form. In the model we assume that the utility function does not differ between individuals, thus $U(\cdot)$ rather than $U_i(\cdot)$. This assumption coincides with the original form of the model. However, in the paper we partially test the assumption, presenting separate models for different groups of individuals: knowledge workers and other workers. Let us denote the difference in utilities between particular job facets v_{ik}, where

$$v_{ik} = U_k(z_{ik}) - U_k(z_{ik}^*)$$

Then, we can present job satisfaction as a weighted sum:

$$\mathrm{JS}_i = \beta_1 v_{i1} + \beta_2 v_{i2} + \cdots + \beta_K v_{iK} + \varepsilon_i, \quad \varepsilon_i \sim N(0,1)$$
$$\mathrm{JS}_i = \beta \mathbf{v_i} + \varepsilon_i,$$

where ε_i is normally distributed random error with expected value 0, independently and identically distributed (*iid*) between individuals. Job satisfaction is assumed to be a latent continuous value that cannot be measured directly. Instead, binary variable js_i is used, which takes value 0 if the utility from the actual job of an individual is lower than the utility from the hypothetical, expected job and value 1 otherwise:

$$\mathrm{js}_i = \begin{cases} 1 & \text{if} \quad \mathrm{JS}_i > 0 \\ 0 & \text{if} \quad \mathrm{JS}_i \leq 0 \end{cases}$$

According to the model we report job satisfaction if the job meets our expectations or the difference between expectations and reality produces a surplus of utility. For example, if the salary is higher than expected, the utility from the job will exceed the salary from the expected employment. Thus the value of the latent variable js_i will be higher.

2.3 Job Satisfaction and Employment Flexibility: Job Security Mix

An interesting factor that draws growing attention in the analysis of job satisfaction is *employment flexibility*. Labour market flexibility, in the most general terms, is concerned with the market's ability to adapt and react to changing conditions (Beatson 1994). There are a number of kinds of flexibilities recognized by scholars. Among others, the basic division separates external flexibility (also called external market flexibility or extensive margin flexibility) and internal flexibility (also called internal numerical flexibility or intensive margin flexibility). External flexibility refers to regulating the amount of labour by changing the number of people employed. Internal flexibility is controlling the amount of labour through adjusting the working time or number of tasks of already-employed workers. The first type of labour market flexibility is often denoted as employment flexibility, whereas the latter is referred to as work-time flexibility (Beatson 1994).

Employment flexibility, usually measured by a proxy, i.e. type of contract, may affect one's job satisfaction directly, as well as together with the impact of other relative variables such as job security. However, some macro-level research shows that in fact a lack of flexibility of contracts (e.g. part-time employment, temporary employment) on a labour market is related to high levels of job insecurity, which is especially prominent among post-socialist EU member states (Fullerton et al. 2011). This could be interpreted as evidence in favour of the flexicurity hypothesis (Origo and Pagani 2009).

Flexicurity is an open concept without strictly designated boundaries. According to the most commonly used definition, flexicurity is a "policy strategy that attempts, synchronically and in a deliberate way, to enhance the flexibility of labour markets, work organization and labour relations on the one hand, and to enhance security of employment and social security—notably for weaker groups in and outside the labour market, on the other hand" (Burroni and Keune 2011). The concept is ambiguous and underspecified which raises doubts about its validity. However, for academic purposes, the flexicurity concept should be used to untangle the merits of the various types of flexibility and security nexuses (Burroni and Keune 2011). One interesting example of the flexibility-security mix is the interplay between employment flexibility and job security.

Job security can be defined as the probability that an individual will keep his or her job. Often, instead of job security, job insecurity is measured. Job insecurity in most general

terms can be defined as the "threat of unemployment" (Witte 2005). Systematic research on the subject of job insecurity, pioneered in the 1980s, suggests that the concept should be operationalised by multidimensional, rather than global, measures. The numerous approaches to the analysis of job insecurity investigate various factors as a part of the concept. The common denominators are two factors: the subjectivity of the phenomenon and the involuntariness of the threat (Sverke and Hellgren 2002). In the first conceptual work on the topic of job insecurity (Greenhalgh and Rosenblatt 1984), a distinction between the *severity of the threat* and *powerlessness,* as dimensions of job insecurity, is proposed. The severity of the threat depends on importance of the loss of a job or a job feature and the subjective probability of the loss occurring. It also encompasses the sources of the threat. The sense of powerlessness, which can exacerbate the perceived threat, can take four forms: a lack of protection, unclear expectancies, an authoritarian environment and the organization's dismissal procedures.

It is important to understand whether seemingly contradictory job characteristics such as job security and employment flexibility can coexist and how they jointly affect job satisfaction. The literature about the direct influence of employment stability on job satisfaction shows that indeed, a lack of employment stability (seasonal contracts) adversely affects workers' job satisfaction (Bardasi and Francesconi 2004; Booth et al. 2002). Job security, on the other hand, has been proven to be a significant factor, strongly determining the job satisfaction of workers (Silla et al. 2008). The joint effect of those variables is ambiguous and interesting to investigate.

Microeconomic studies on the joint effects of employment flexibility and job security give empirical evidence proving the significance of self-perceived flexicurity. It has been shown that the negative impact of instability, which is implied by flexible employment, can be compensated for by the high level of job security. A flexible employment-secure job has been proven to be favoured over a permanent insecure job, while no significant differences have been shown between job-secure permanent and job-secure temporary workers (Origo and Pagani 2009).

2.4 Knowledge Work and Job Satisfaction

It has been shown that the influence of employment stability is not equal among different groups of individuals. For instance, in an empirical study conducted on Spanish workers, although the type of contract turned out to be a significant explanatory variable in a regression of job satisfaction, the results lost their significance, when the regression was run only for women (Burón 2007). This finding raises a question about differences between individuals divided into subgroups. Working individuals may be distinguished by individual characteristics (such as age, place of living, marital status), job characteristics (such as economic sector, industry classification) and many others. It is worth disaggregating the analysis of job satisfaction and having a closer look at a specific workforce group. The group discussed in this paper are knowledge workers.

In modern economies the knowledge sector is constantly expanding and the post-industrial model of the knowledge economy is becoming the norm within the more developed countries. Thus, it seems reasonable to divide the analysis of job satisfaction and its determinants between the workers of the relatively new, yet dynamically enlarging sector and individuals working in more traditional occupations.

The differences encountered in the analysis of job satisfaction of men and women seem to evanesce in the case of females with attributes matching the characteristics of knowledge workers. This suggests that this particular group of individuals has specific

expectations diverging from the expectations of other workers. In terms of the discrepancy theory, we can assume that the importance knowledge workers give to various aspects of work does not vary within this group, but differs substantially from the values appreciated by the rest of the workers.

To analyse the job satisfaction in the context of knowledge economy, it is crucial to establish a definition of a knowledge worker. However, a precise and straightforward definition of a knowledge worker does not exist. An occupational approach defines knowledge workers as "professional, managerial and technical people" (Drucker 1993). Another way to define knowledge workers is to specify the content of their job, describing them as individuals whose work requires high levels of creativity, intellective skills and theoretical rather than purely contextual knowledge (Warhurst and Thompson 2006).

However, this type of conceptualisation is difficult to operationalise due to the scarcity of data about the actual character of the activities individuals carry out at work. For that reason, the occupation-based approach, which is closer to Drucker's definition of knowledge workers, is often used to operationalise this concept. According to this classification, knowledge workers are persons who work in the top three ISCO occupational classifications (managers, professionals, associate professionals), have high level skills indicated by higher education or equivalent qualifications and perform tasks that require expert thinking and complex communication skills with the assistance of computers (Brinkley 2006). The categories are not exclusive and may overlap.

This occupation-based classification, as well as education-based classification is vulnerable to mistakes, as many of the workers that would be included in these categories usually would not be regarded as knowledge workers (i.e. managers of small firms, higher education graduates not working in the knowledge sector, etc.). The way to minimise the error margin is to classify persons as knowledge workers if and only if they fulfil all three of the above-mentioned classification conditions. The term "knowledge worker" differs conceptually from high-skilled workers in the sense that the latter has a much broader range. According to both presented approaches, knowledge workers are high-skilled by definition. This is a necessary, but not sufficient condition in order to be classified as part of this group. Knowledge workers not only possess certain skills, they also use them to produce, distribute and use knowledge (Davenport 2005).

The advantage of using the occupation-based approach together with the education-based approach is that it is a standard, used in most of the studies, as well as in the macro-level accounts. Thus, applying the three above-mentioned conditions in the study will allow the results to be comparable with outcomes of other studies of similar interest. Due to this, the standard for defining the knowledge workers group has been used in this study. The reference group of workers who do not comply with the characteristics of knowledge workers are referred to as "other workers" throughout the rest of the paper.

2.5 Employment Structure in Poland

The structure of employment in Poland in terms of employment flexibility differs considerably from other EU countries. It is a country with the largest percentage of temporary workers in Europe. Almost 27 % of all employed individuals worked under a temporary contract in the years 2011 and 2013. The EU average for these periods is significantly lower, equal to 14 %. This statistic seems surprising, taking into account that in other post-communist countries temporary employment constitutes a significantly smaller part of total employment (European Commission 2013b).

Poland also has a high percentage of self-employed individuals. With 18.5 % of workers being self-employed, it exceeds the European average by 4 pp and is the state with the fourth highest percentage of self-employed individuals in Europe. This difference stems from the high percentage of own-account workers (self-employed persons without employees) in Poland—14.4 % in 2011 and 13.9 % in 2013, compared to other European countries—the EU average for 2011 and 2013 equals to 9.7 % (European Commission 2013c). The relative number of employers (self-employed workers with employees) in Poland is close to the EU average—4.1 and 4.2 %, respectively (European Commission 2013a). One can conclude that Poland is a country with a relatively low percentage of permanent workers, despite its history. The macro-level data show the Polish labour market is structured in a very flexible way. For that reason the concept of flexicurity of the labour markets, as promoted by the European Commission, is especially relevant in the Polish milieu. In particular, in the case of high employment flexibility it is vital to ensure job security, and, in more general terms, employment security, including the ease of transition between jobs.

Macroeconomic measures are informative, however they do not accurately reflect the actual state of the labour market in terms of flexibility, security and above all their interplay. The study of the flexibility and security nexus, or, in other words, flexicurity, needs to be complemented by microeconomic level analysis. According to the statistics from 2006, Poland is the third least job secure country in Europe (Fullerton et al. 2011). The presented measures suggest a failure to meet flexicurity conditions in Poland. However, little is known about the flexibility-security mix on an individual level in this country. Investigating flexicurity and its effects on job satisfaction at the microeconomic level in a Central European (CEE) country gives a new contribution to already existing literature, which has so far focused mainly on the Western European countries.

3 Hypotheses

The goal of the presented paper is to examine under what conditions workers are more likely to feel satisfied with their jobs and how these conditions differ between knowledge workers and other workers. The main focus of the study is the effect of employment flexibility and job security on job satisfaction. In particular, the objective of the analysis is to verify the following hypotheses:

H1 Job security, in particular financial security, is a determining factor that positively impacts job satisfaction, regardless of the type of employment contract.

H2 Unlike other workers, knowledge workers are more likely to be satisfied with a job that has a more flexible employment arrangement.

H3 The job satisfaction of knowledge workers is less influenced by a lack of job security than the job satisfaction of other workers.

   a. The job satisfaction of knowledge workers is less influenced by financial uncertainty than the job satisfaction of other workers.
   b. The job satisfaction of knowledge workers is less influenced by work overload than the job satisfaction of other workers.
   c. The job satisfaction of knowledge workers is less influenced by hostile relations at work than the job satisfaction of other workers.

One of our goals is to analyse the popular idea of flexicurity and its practical application in the labour market in Poland. In the 2000s, one Polish objective in terms of job market development was to introduce the flexicurity model, as part of the Lisbon Strategy (European Commission 2007). Flexicurity combines the regulations concerning employment flexibility and the social security system that would provide a warranty of employment security. Compared to other European countries, Poland is a country with a high percentage of flexible employment arrangements. There is even a greater difference between Poland and other transition economies.

An interesting question with regards to these macroeconomic statistics is whether the high percentage of temporary and own-account workers is the result of the effective implementation of the flexicurity model or if it is a manifestation of the high rate of precarious work in Poland. Existing empirical evidence, presented by Origo and Pagani (2009) shows that employment flexibility and job security may coexist. In the same study, the authors show that job security, rather than the type of contract, is the determining factor of job satisfaction. They show that there are no statistically significant differences between flexicure workers and permanent (secure) workers. At the same time, they found that the permanent workers at risk—the ones feeling insecure about their jobs, are less satisfied than workers with temporary contracts who feel secure about their positions.

In this paper that outcome is verified using data from a Polish survey, and the hypothesis that in the flexibility-security nexus, the security ingredient is predominant is tested. We hypothesise that there is no difference in job satisfaction between permanent secure workers and flexible secure workers. (**H1:** Job security, in particular financial security, is a determining factor that positively impacts job satisfaction, regardless of the type of employment contract).

Another objective of the paper is to compare the influence of employment flexibility on job satisfaction for the two analysed groups. We want to show how these two job facets influence workers' satisfaction differently, dependently on the type of work they are involved in. We assume that knowledge workers value the possibility of mobility more than other workers. Thus, we believe that flexible employment will be more satisfying for knowledge workers than stable employment (**H2:** Unlike other workers, knowledge workers are more likely to be satisfied with a job that has a more flexible employment arrangement).

The last hypothesis (**H3:** The job satisfaction of knowledge workers is less influenced by a lack of job security than the job satisfaction of other workers) concerns job security and its influence on the job satisfaction of the analysed groups. According to the discrepancy theory, job satisfaction reveals the difference between the expectations based on the different job facets and their actual values. Yet, these differences matter only if the given job facet is valued by an individual (Locke 1976). In the context of job security, a recent study on job insecurity and employment of entry-position workers in the creative industry shows that young creative workers do not feel less satisfied with their jobs due to low job security, as it matches their expectations associated with the chosen job. Also, even more significantly, some young creative workers see low job security as an advantage, as they value job mobility and want to depart from the Fordist job-for-life paradigm (Morgan et al. 2013).

We assume that, similarly to young creative workers, established knowledge workers value more mobility than job stability and have a sense of high employment security on the job market. Thus, they do not value security in a certain job as highly, and it therefore has little impact on their job satisfaction. On the contrary, even though other workers might not have great expectations with regards to their job security, they value it more and, therefore

even small discrepancies between expectations and actual security have a great influence on their job satisfaction. We pinpointed three specific aspects of job insecurity that we take under consideration in the analysis: **H3a.** financial uncertainty, **H3b.** work overload and **H3c.** hostile relations at work. We believe the three variables are complementary and add a new angle to the concept of job security.

4 Data and Descriptive Statistics

4.1 Sample

The analysis employs secondary data from *Social Diagnosis 2011* (Czapiński and Panek 2011) and *Social Diagnosis 2013* (Czapiński and Panek 2013). The Social Diagnosis project, initiated in the year 2000, is a diagnosis of the conditions and quality of life of Poles. The datasets from the years 2011 and 2013 are part of the panel comprising seven waves. In the context of the analysed issues, the macroeconomic situation in Poland has been relatively stable for a number of consecutive years, including 2011 (European Commission 2013a, b). For this reason, the cross-sectional study for this period holds face validity. Yet, as the used data enable comparisons between years, two consecutive waves have been introduced in the analysis to verify the robustness of the presented outcomes. The previous waves have been disregarded as they do not contain all the variables relevant for the analysis and are considerably smaller.

The Social Diagnosis 2011 and 2013 datasets contain vast amounts of data from a large and representative sample. The data have been collected by Polish Central Statistical Office. In both waves two-stage stratified sampling was applied to find households that took part in the surveys. Firstly, households were stratified by voivodeships and then within voivodeships, by the size of agglomeration. The first stage sampling units were statistical regions (covering at least 250 households), and rural strata statistic circuits. In the second stage two households within each of the layers formed in the first stage of sampling were drawn systematically from a randomly ordered list of households.

The wave from 2011 comprises data from 12,383 households and 26,445 individuals (Czapiński and Panek 2011). After reducing the dataset by removing observations not appropriate for the analysis and incomplete cases, 8,297 observations were used in the analysis. This drastic reduction in the number of observations is related to selecting the target group for our research. As we are interested in the job satisfaction of workers, we excluded from the analysis all unemployed persons and people outside the labour market. Additionally, we eliminated farmers from the analysis, as the work performed by this group has a profoundly different nature than the type of work relevant to our research. Analysing farmers as a separate group is beyond the scope of this paper. Employers—self-employed persons with employees were also excluded from the analysis due to the difference in the nature of work. As a result of the data reduction process 10,253 cases remained. The exercise of data cleaning was repeated for the wave of 2013. Out of 26,307 cases available in this wave, 9,875 were classified as relevant for the analysis.

Finally, incomplete cases were excluded from the analysis. There were 1,956 incomplete cases in the wave from 2011. This large number is mostly due to the income variable, which had over 1,400 missing values. In the wave of 2013, after a reduction of the dataset by 1,918 incomplete cases (of which 1,218 were due to missing values in the income variable), 7,957 observations remained. Although we intended to omit the income variable, the fit of the models without income was highly unsatisfactory. Apart from that, income is

one of the crucial factors of job satisfaction and there is a need for a control factor measuring it. For that reason, the variable was kept in the analysis at the cost of sample shrinkage.

Alternatively, relative income (i.e. the change between present income and income from previous waves), instead of, or next to, the income level could have been used in the models. In the literature there is no agreement on the subject of the long-term influence of income increase on subjective well-being. The well-known Easterlin (1974) paradox suggests that, in macroeconomic terms, in the long run the average level of happiness in a country does not change in spite of fluctuations in GDP. The conclusions may be translated to micro scale, suggesting that the change in the income level of individuals influences their subjective well-being only for a short period. Some empirical research has under-mined this claim showing an association between income increase and increased happiness (Stevenson and Wolfers 2008). It is also not clear what can be treated as long term (Easterlin et al. 2010). The reassessment of these not clarified issues is beyond the scope of the presented article. For that reason, relative income has been not introduced to the model. From the technical point of view, as in Social Diagnosis not all the respondents took part in all waves, including this variable would reduce the sample even further, which could have an adverse impact on the validity of the analysis.

4.2 Dependent Variable: Job Satisfaction

Originally, the variable concerning job satisfaction consisted of 6 levels: Very Satisfied, Satisfied, Quite Satisfied, Quite Unsatisfied, Unsatisfied and Very Unsatisfied, presented in Table 1. However, the distribution of this variable was significantly positively skewed; that is to say that most of the responses accumulated around Satisfied and Quite Satisfied. For that reason, the levels were aggregated to group the responses equally between the two levels.

As a result, the levels Very Satisfied and Satisfied which constituted over 46 % of the responses in 2011 and 43.5 % of the responses in 2013, were accumulated into one level: Very Satisfied and Satisfied, whereas the remaining four levels of the original variable, Quite Satisfied, Quite Unsatisfied, Unsatisfied and Very Unsatisfied, were accumulated into the Not Satisfied level.

Table 1 Job satisfaction (6 levels)—distribution

	2011			2013		
	Frequency	Percentage	Cumulative %	Frequency	Percentage	Cumulative %
Very satisfied	633	7.6	7.6	549	6.9	6.9
Satisfied	3190	38.4	46.1	2910	36.6	43.5
Quite satisfied	3043	36.7	82.8	3067	38.5	82.0
Quite unsatisfied	775	9.3	92.1	780	9.8	91.8
Unsatisfied	483	5.8	97.9	472	5.9	97.8
Very unsatisfied	173	2.1	100.0	179	2.2	100.0
Total	8297	100.0		7957	100.0	

Source: Own elaboration based on Rada Monitoringu Społecznego (2011) and Rada Monitoringu Społecznego (2013)

Another attempt at reorganising the variable was to divide it into three levels, making Quite Satisfied—the most common answer among the respondents—a separate level. The ordered logit models were estimated for the groups of knowledge workers and other workers. However, the results were unsatisfactory, as no significant differences between the second (Quite Satisfied) and the third (Not Satisfied) groups were detected.

Furthermore, the objective of the presented analysis is to investigate how the factors of interest contribute to, or hinder, achieving the feeling of being actually satisfied with a job, rather than to compare the influence of these factors on particular levels of the job satisfaction variable available in the dataset. Thus, we believe that aggregating the two top levels of the variable into one category and the remaining four into the reference category is an adequate approach to reach the research goal.

4.3 Job Insecurity Variables

Job insecurity is measured by three indicators: Income Source Uncertain; Too Many Duties to cope with; Treated Unjustly at Work. Initially, the variables could take one of four values: Never, Sometimes, Often or Not Applicable. We aggregated these levels into two categories: Yes and No. In the case of the first variable we treated Not Applicable level as missing case, as we assume that all respondents from our sample gain some income from their job. In the case of the latter two categories, we aggregated the Not Applicable level together with Never, as we assume that there are kinds of workers to whom situations of being treated unjustly at the workplace or having too many duties do not apply.

Each of the items has a slightly different dimension and strength. The distances between the levels of these variables are also not equal. None of the three variables measures perceived job insecurity *per se*, but three different aspects of it. The first item concerns financial insecurity. It refers to the source of income, which is not necessarily the job. It can also refer to, for instance, financial continuity after losing a job, provided by unemployment benefits. In that sense this variable is semantically the closest to the notion of employment security. In the job insecurity framework proposed by Greenhalgh and Rosenblatt (1984) it represents the severity of the threat of job loss. In particular, it can be interpreted as the severity of the threat of losing a specific job feature, namely pay.

Two other variables selected for the job security scale represent psychological aspects of job insecurity, which can be regarded as intangible symptoms of the threat of job loss. Within the mentioned framework, the second item—an overload of duties that one cannot cope with can be classified as the source of the threat. A worker overwhelmed by the number of duties may treat his or her perceived inefficiency as the potential threat of job loss. The third item—the feeling of being treated unjustly at work, represents the sense of powerlessness. According to Greenhalgh and Rosenblatt (1984), the sense of powerlessness would be intensified if there were no strong norms of fairness in the workplace and superiors were perceived as arbitrary in their evaluations.

4.4 Employment Flexibility: Type of Contract

Employment flexibility is measured by the type of contract proxy variable. In the analysis we distinguished between three types of contracts: Permanent Contract, Temporary Contract and Self-Employment. The second category includes fixed-term contracts for a period of over 1 year, part-time contracts, short-term contracts, work trial contracts, hired work with a written contract and hired work with a spoken contract or without a contract. The third category is for own-account workers—self-employed persons without employees.

The self-employed persons with employees (employers) were excluded from the ana-
lysis as the employment flexibility of this group is based on the nature of the occupation
rather than is imposed by the demands of flexible labour markets. The first category applies
solely to persons with permanent contracts. However, the group of permanent workers is
much more sizeable than the other categories, representing over 65.5 % of the sample. The
percentage of individuals with temporary contracts equals to 28.1 % and own-account
workers is around 6.3 %.

4.5 Type of Worker

The type of worker variable was constructed in two steps. First, all individuals that have a
job were selected with the use of four variables: Any paid work or a helper without pay in
the family business performed during the last 7 days; An employee, self-employed person
or helper without pay in the family business who has temporarily not performed his/her
work during last 7 days; Main source of income; Secondary source of income.

The first two variables determine if an individual performs any job (paid or unpaid). The
latter two help to restrain the dataset to the observations from respondents who gain any
profit from their work activities. In the second stage the dataset is divided into two groups:
Knowledge Workers and Other Workers. Knowledge workers are determined through the
educational level of the worker, the ISCO occupational classification and if the workers use
computer.

According to the used operationalisation of the concept of knowledge worker and given
the mentioned variable-setting criteria, the persons that belong to the group of main interest
are individuals with higher education (Bachelor's degree or higher), working in the top
three occupational classifications (according to the ISCO classification)—managers, pro-
fessionals or associate professionals and use a computer. With the described criteria 3,821
knowledge workers were selected from the whole sample.

4.6 Type of Worker: Characteristics

One of the main focuses of the paper is to recognise the differences in job satisfaction
between two groups—knowledge workers and other workers, in particular, to recognise if
various factors influence the job satisfaction of workers from these two groups differently.
Table 2 presents the means and frequencies of the variables used in the model for the two
groups of workers for the years 2011 and 2013. There are only small differences in the
results between the 2 years. In the group of other workers, the differences in personal
income, age and years of study have turned out to be significant; yet the differences are
marginal. Significant percentage change was also noted in the following variables: Man-
ager, Income Source Uncertain, Too Many Duties, Treated Unjustly at Work and Job
Satisfaction. In the group of knowledge workers, the difference in income has turned out to
be significant, although yet again the change is marginal.

What is more, between 2011 and 2013 two significant changes have taken place: a rise
in the percentage of workers with insecure income and a simultaneous drop in job satis-
faction. In both groups the greatest change was noted in the percentage of income insecure
workers. In the group of other workers it grew by almost 5 pp, whereas in the group of
knowledge workers it increased by 8 pp. The group of other workers in 2013 has also
notably higher percentage of workers who feel they have too many duties (2.8 pp) and
those who feel that they are treated unjustly at work (2.2 pp). The higher job insecurity
seems to translate into a lower percentage of satisfied and very satisfied workers, in both

Table 2 Characteristics of knowledge workers and other workers

| | 2011 | | | | 2013 | | | |
| | Other worker | | Knowledge worker | | Other worker | | Knowledge worker | |
	Mean	%	Mean	%	Mean	%	Mean	%
Personal income	1827		2935		1937[a]		2992[a]	
Age	42		41		42[a]		41	
Years of study	12		17		12[a]		17	
Sex								
Male		56.6		36.0		55.9		35.2
Female		43.4		64.0		44.1		64.8
Manager		7.3		24.0		5.8[b]		21.8
Income source uncertain		64.2		46.6		69.1[b]		54.6[b]
Too many duties		56.5		57.3		59.3[b]		57.9
Treated unjustly at work		47.8		48.0		50.0[b]		47.7
Type of contract								
Permanent		62.1		78.0		61.3		77.9
Temporary		31.3		16.9		31.8		17.3
Own-account		6.6		5.2		6.9		4.8
Job satisfaction								
Not satisfied		56.7		44.6		59.0[b]		48.7[b]
Satisfied and very satisfied		43.3		55.4		41.0[b]		51.3[b]

Source: Own elaboration based on Rada Monitoringu Społecznego (2011) and Rada Monitoringu Społecznego (2013)

[a] For these variables the t-tests for equality of means showed significant differences between 2011 and 2013 at the level of significance $\alpha = 0.05$

[b] For these variables the χ^2 test for independence of samples showed significant differences between 2011 and 2013 at the level of significance $\alpha = 0.05$

groups: other workers (2.3 pp) and knowledge workers (4.1 pp). The decrease in job satisfaction and the rise of income insecurity may reflect the general downturn in Polish economy in 2013, compared to the year 2011. Although Poland did not suffer from the economic crisis as strongly as most of the European countries, the growth of its economy notably slowed down. The GDP growth rate (in constant prices) has diminished by 2.9 pp (Central Statistical Office of Poland 2014). Another indicator of the slowdown in Polish economy is a slight increase (0.6 pp) in unemployment rate that occurred in Poland between 2011 and 2013 (European Commission 2013c). Worsening conditions on the labour market might have a reflection in job insecurity.

One of the biggest differences between the group of knowledge workers and the group of other workers is their level of income. Other workers on average earn almost 40 % less than knowledge workers. Knowledge workers earned on average 2,935 zlotys (731€) per month in 2011 and 2,992 zlotys (720€) per month in 2013, while the monthly wage of the other workers in these periods was equal to 1,827 zlotys (455€) per month and 1,937 zlotys (466€) per month, respectively. The Euro equivalents were calculated using the average

exchange rate from March 2011 and March 2013—the months in which the data were gathered (Narodowy Bank Polski 2014).

In both waves, knowledge workers on average studied for 17 years, whereas the other group spent on average 5 years less on education. This outcome is not surprising, because of the design of the knowledge worker category. As explained before, one of the conditions for being classified as a member of this category was a higher education. Although in general the majority of employed persons are males, this proportion is reversed in the case of knowledge workers. In this group females constitute over 64 % (64.8 % in 2013) of the whole group. The percentage of individuals with supervisor positions is much higher among knowledge workers. Almost a quarter of them are managers (21.8 % in 2013), whereas just under 7 % (5.8 % in 2013) of the other workers have a managerial position. This great difference is also the result of the design of the type of worker variable. The variable is controlled for in the causal model.

The majority (64.2 % in 2011 and 69.1 % in 2013) of other workers feel that their income source is precarious and insecure. The knowledge worker group is more secure with 46.6 % (54.6 % in 2013) of individuals feeling uncertain about their income source. In both groups, most of the respondents at least sometimes feel that they have too many duties to cope with. In both groups almost half of the individuals feel or have felt treated unjustly at work. For the group of other workers this rate has increased to 50 % in 2013.

Surprisingly, there are relatively more other workers with high employment flexibility (i.e. workers with temporary contracts or own-account workers). This finding seems to be counter-intuitive, as one of our assumptions is that knowledge workers value job flexibility and the mobility possibilities. Yet, around 78 % of knowledge workers have a permanent contract, which is a high rate, especially compared to only 62.1 % (61.3 % in 2013) of other workers with permanent contracts. Finally, we can see that around half of the knowledge workers (55.4 % in 2011 and 51.3 % in 2013) feel very satisfied or satisfied with their jobs. For other workers this percentage is considerably lower (43.3 % in 2011 and 41 % in 2013).

One of the main focuses of this paper is to investigate the interplay between employment flexibility and job security among the groups of knowledge workers and other workers. To have a better insight into the issue of job insecurity in the case of the two analysed groups, the sample (presented separately for wave 2011 and 2013) has been described with respect to job insecurity and employment flexibility in Table 3. It needs to be taken into account that the group of flexible workers is substantially smaller than the group of permanent workers—especially among knowledge workers, where flexible

Table 3 Employment flexibility and income source security

	2011				2013			
	Other worker		Knowledge worker		Other worker		Knowledge worker	
	Income source uncertain				Income source uncertain			
	No (%)	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)
Permanent	42.6	57.4	58.1	41.9	37.0	63.0	49.0	51.0
Temporary	25.0	75.0	39.3	60.7	21.7	78.3	34.1	65.9
Own-account	23.2	76.8	28.6	71.4	19.7	80.3	26.9	73.1

Source: Own elaboration based on Rada Monitoringu Społecznego (2011) and Rada Monitoringu Społecznego (2013)

workers constitute fewer than a quarter of all respondents. Among other workers this percentage is higher, with almost 40 % of workers being under flexible employment arrangements. In the knowledge worker and other worker groups, own-account workers group constitutes only around 7 and 5 %, respectively, of all employment.

For all workers from both groups, the percentage of financially insecure persons grew between 2011 and 2013. The greatest increase can be noted in the group of permanent knowledge workers (9.1 pp) and other permanent workers (5.6 pp). Also, a significantly bigger percentage (a 5.2 pp increase in 2013) of temporary knowledge workers has reported financial insecurity in 2013. Among the groups of temporary knowledge workers and own-account other workers the relative drop in number of income secure individuals in 2013 was similar (3.3 pp and 3.5 pp, respectively). The smallest change was reported in the group of own-account knowledge workers (1.7 pp).

The groups of knowledge workers and other workers differ considerably in the percentage of income insecure employees (41.9 and 57.4 % in 2011 and 51 and 63 % in 2013, respectively). However, in both groups we can see a large gap between permanent workers and flexible workers. In the case of knowledge workers, the percentage of insecure individuals is especially high for own-account workers. Less than a third of own-account knowledge workers do not struggle with the problem of income source insecurity. In contrast, almost 60 % of permanent knowledge workers (51 % in 2013) feel secure. Indeed in most cases, flexible employment can be characterised by job insecurity.

5 Estimation and Results

Two separate models for the knowledge workers and other workers have been considered in the analysis. This approach enables the comparison of the significance of each factor and strength for both groups. We argue that it is a preferable solution over estimating a single model with a set of interactions, as it produces a less complex outcome, more convenient for interpretation. The Age Squared variable has been added to the independent variables initially used in the models. The nonlinear relationship between age and job satisfaction has been empirically proven (Clark et al. 1996). In particular it has been shown that there is a U-shaped relationship between job satisfaction and age. This result has been also widely replicated in other empirical research, e.g. Lange (2009); Lévy-Garboua and Montmarquette (2004); Millán et al. (2011).

Table 4 and Table 5 present final models for both groups. In order to verify the robustness and stability of the model, the significance of the differences between the results in two waves—the years 2011 and 2013 has been tested. Namely, to estimate the model, observations from 2011 and 2013 have been used, treated as separate cases. Additionally, a dummy variable indicating the wave a given observation comes from has been introduced. To test the significance of differences between the two periods for every variable, interactions between the dummy variable and every variable present in the model (including interaction terms) have been included. Coefficients of these interactions, presented in column 2 of Table and Table 5, represent differences between the value of the coefficient in 2011 and 2013. Their statistical significance indicates if the differences between results in 2011 and 2013 are significant.

The models comprise a number of socio-demographical variables such as Logged Income (logarithm with base of 2), Age and Age Squared, sex (Male) and Years of Study. Another group of factors are work-related variables: managerial position (Manager), Temporary contract, Own-Account workers and job insecurity variables: Income Source

Table 4 Logit model for group of knowledge workers

	2011			Change between 2011 and 2013		
	B	SE	EXP(B)	B	SE	EXP(B)
Logged income	.194***	.068	1.214	.097	.099	1.102
Age	.029	.031	1.029	−.121***	.047	.886
Age squared	.000	.000	1.000	.001***	.001	1.001
Male	−.263***	.097	.769	−.144	.135	.866
Years of study	.021	.027	1.021	.013	.036	1.013
Manager	.209	.112	1.233	.066	.160	1.068
Temporary	.143	.199	1.153	−.053	.279	.949
Own-account	2.037**	.857	7.669	−1.154	.986	.315
Income source uncertain	−.965***	.104	.381	.147	.145	1.159
Too many duties	−.199**	.099	.819	−.115	.137	.891
Treated unjustly at work	−1.071***	.096	.343	.023	.135	1.023
Temporary × income source uncertain	.134	.249	1.144	.115	.345	1.122
Own-account × income source uncertain	−1.798**	.883	.166	1.026	1.036	2.790
Constant	−1.984	.950	.138	.818	1.389	2.266
N	3821					
	(1887 in 2011 and 1934 in 2013)					
Log likelihood	−2977.018					
Akaike Inf. Crit.	6010.035					

Source: Own elaboration based on Rada Monitoringu Społecznego (2011) and Rada Monitoringu Społecznego (2013)

B coefficient, *SE* standard error, *Exp(B)* exponentiated coefficient

** $p < 0.05$; *** $p < 0.01$

Uncertain, Too Many Duties to cope with and Treated Unjustly at Work. The permanent contract is not included in the model as it is chosen to be a baseline category. Finally, included in the model are interactions between employment flexibility and financial insecurity that will help verify the research hypothesis H1.

Table 4 and Table 5 report estimates, standard errors and exponentiated estimates from the two estimated models. The exponentiated estimates in most cases are equal to the odds ratios (OR), yet the exponentiated coefficient of interaction is the ratio of OR, whereas exponentiated constant is the baseline odds. The OR might seem hard to interpret, yet they come in handy as, unlike coefficients of logit models, they are independent from the values of other variables, thus possible to interpret separately for each variable. Odds ratio shows how the odds of a given outcome will change under a given condition compared to odds of the outcome when a condition is not satisfied.

In the case of the logit model estimated for knowledge workers (Table 4), the sole significant difference between 2011 and 2013 was detected in the variables Age and Age Squared. Surprisingly, it is not only a quantitative but also a qualitative difference. In 2011, the variables Age and Age Squared were shown to have no influence on the analysed dependent variable. In 2013 on the other hand, Age Squared was shown to have significant positive influence on job satisfaction, whereas the relationship between age and job satisfaction was shown to be significantly negative, which would prove a U-shaped

Table 5 Logit model for group of other workers

	2011			Change between 2011 and 2013		
	B	SE	EXP(B)	B	SE	EXP(B)
Logged income	.334***	.041	1.397	.107*	.060	1.113
Age	−.061***	.017	.941	−.009	.024	.991
Age squared	.001***	.000	1.001	.000	.000	1.000
Male	−.215***	.055	0.807	.057	.080	1.058
Years of study	−.055***	.012	.946	.025	.018	1.026
Manager	514***	.099	1.672	−.303**	.151	.739
Temporary	−.074	.102	.929	−.152	.152	.859
Own-account	.231	.208	1.260	.032	.324	1.033
Income source uncertain	−.505***	.067	.604	−.065	.098	.937
Too many duties	−.545***	.057	.580	−.042	.082	.959
Treated unjustly at work	−.630***	.057	.533	−.146	.082	.864
Temporary × income source uncertain	−.110	.122	.896	.184	.180	1.203
Own-account × income source uncertain	−.108	.238	.898	.185	.363	1.203
Constant	−.504	.556	.604	−1.396	.775	.248
N	12433					
	(6410 in 2011 and 6023 in 2013)					
Log likelihood	−8336.012					
Akaike Inf. Crit.	16,728.030					

Source: Own elaboration based on Rada Monitoringu Społecznego (2011) and Rada Monitoringu Społecznego (2013)

B estimate, *SE* standard error, *Exp(B)* exponentiated coefficient

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

relationship between age and job satisfaction. However, the nature and significance of this relationship is not the subject of interest in the presented analysis.

In the case of the model for other workers, more significant differences between the 2011 and 2013 waves have been identified. According to the conducted test, the model results for the: Logged Income and Manager variables are significantly different in 2011 and 2013. Yet, for this group, the difference occurred only in the strength of relationships. In the model for 2013 income has turned out to have a stronger positive impact on probability of being satisfied or very satisfied with a job. On the other hand, having a managerial position has a weaker, yet still positive, influence on the dependent variable.

As expected, income has a positive impact on job satisfaction, meaning that the more someone earns, the more probable it is that they are satisfied with their jobs. The impact of income is stronger in the case of other workers. According to the model for this group, doubling the income—as variable Logged Income is a logarithm of income with base of two—would result in a 1.4 effect on the OR. That is to say that it would raise the odds of being satisfied versus being not satisfied by 40 % (OR 1.397). Knowledge workers, by doubling their income, would on average increase the odds of being satisfied with their jobs by 20 % (OR 1.214). The smaller influence of financial aspects on the job satisfaction of knowledge workers might be explained by the different priorities of the groups of interest. However, it may also be because the marginal utility of money diminishes. This is to say

that other workers on average earn substantially less than knowledge workers, therefore they benefit from a rise in income more.

Age has been proven to be a significant variable for other workers. The U-shaped function of job satisfaction in age has been confirmed, as the Age Squared is significant in the model for this group. As mentioned before, in the case of knowledge workers, the nature of the relationship between age and job satisfaction is ambiguous, as the results differ significantly between the waves.

Another finding replicates the results of many previous studies, e.g. Burón (2007); Clark (1997), namely that, according to both estimated models, men are less satisfied with their jobs than women. The odds of being satisfied with a job are 20 % lower for male other workers (OR 0.807) and 23 % lower for male knowledge workers (OR 0.769), than for females from the same groups. The discrepancy theory brings a plausible explanation for this result. As men have higher expectations towards their job, the difference between the expectations and reality is greater than in case of less demanding women.

Surprisingly, the time other workers have devoted to education, measured by the years individuals have spent studying, adversely affects their probability of achieving job satisfaction. According to the model, the odds of being very satisfied or satisfied with one's work decrease by almost 5 % (OR 0.946) with each additional year of study. The variable does not influence the job satisfaction of knowledge workers. These findings can also be explained by the discrepancy theory. A person who spent more years in education would most probably have more expectations towards their job. However the expectations exceed the labour market offers, thus creating a bigger gap between "dream job" and the actual job. The not satisfied other workers may be, for example, higher education graduates who did not manage to find employment in the desired sector and thus got low or negative return from the investment they made in education.

Having a managerial position significantly increases the chances of being satisfied with a job, especially among the group of other workers. In the proposed model, the odds of being satisfied for other workers with managerial positions are over 67 % higher than for the rest of the workers from this group (OR 1.672). This relationship has already been shown in previous research (Clark 1997). The feeling of being in charge and having a certain amount of power may be desirable in a job. Thus, once achieved, this may increase the probability of job satisfaction. In the model designed for knowledge workers, the variable turned out to be insignificant at the significance level of 5 %.

The variables denoting employment flexibility—temporary contracts and self-employment without employees—turned out to be insignificant for the group of other workers. On the other hand, the odds of own-account knowledge workers being satisfied are almost eight times higher than the odds of knowledge workers with permanent contracts being satisfied (OR 7.669). This confirms hypothesis H2 that, unlike other workers, knowledge workers are more satisfied under more flexible employment arrangements. Yet, this relationship is only true for knowledge workers who feel safe regarding their income.

The interaction term between own-account workers and an uncertain income source turned out to be significantly negative. This suggests that the OR between own-account and permanent knowledge workers, who feel their income source is precarious, is lower. In particular, the odds of an own-account knowledge worker who is insecure are only 27 % higher than the odds of a permanent knowledge worker who feels the same about his or her job (OR 1.273). The exponentiated estimate of the interaction term in the model represents the ratio between the OR in a situation when both of the conditions included in the interaction term occur and when one of them does not. In this case the exponentiated coefficient of interaction term Own-Account × Income Source Uncertain [Exp(B) = 0.166] in the

model for knowledge workers represents the ratio between the OR of own-account versus permanent workers when income insecurity occurs and in the case when it does not. The latter ratio can be directly read from Table 4 (OR 7.669). In order to obtain the OR of insecure self-employed knowledge workers, the two numbers need to be multiplied, therefore $0.166 \times 7.669 = 1.273$. The difference in odds is much smaller under the condition of insecurity. However, it is still in favour of self-employment. Taking into account that the vast majority of own-account knowledge workers feel insecure about their income while the majority of permanent knowledge workers do not share this fear, a comparison should be made between these two groups in the context of job satisfaction.

In logistic regression, the probability of attaining job satisfaction is dependent from all the variables. Therefore, the comparison of the probability of job satisfaction for four groups of knowledge workers: permanent secure, permanent insecure, own-account secure and own-account insecure is presented for individuals with certain characteristics.

As presented in Fig. 1, the probability of job satisfaction is indeed higher for insecure own-account knowledge workers than for permanent workers with the same perception of their income source insecurity. However, permanent knowledge workers who are secure about their income are more likely to be satisfied than own-account knowledge workers who feel their income is uncertain. This finding shows that the knowledge workers' preference for employment mobility is conditioned by job security. Own-account work is only favoured over permanent secure positions, if, *ceteris paribus*, it also gives a guarantee of job security.

All the variables denoting job insecurity have significant negative influence on the job satisfaction of other workers. Individuals from this group who feel their income source is insecure are 40 % less likely to be satisfied with their jobs than the other workers who do
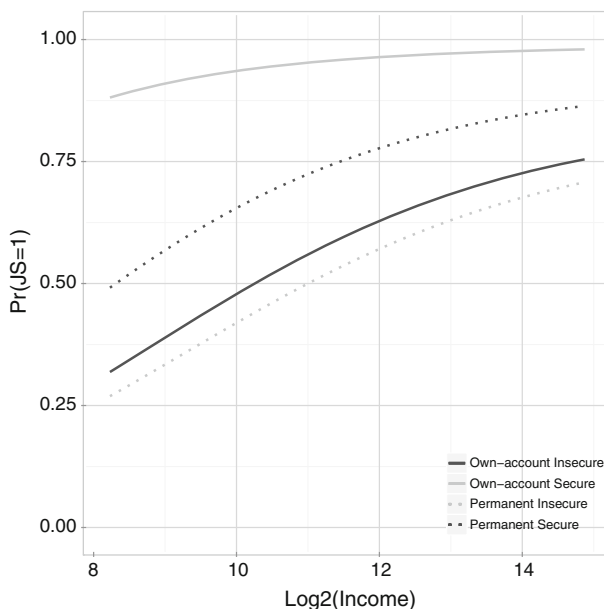
Fig. 1 Probability of attaining top levels of job satisfaction as a function of logged income (The functions are estimated for individuals with following characteristics: Knowledge worker, 41-years old, Studied for 17 years, Male, Non-manager, Does not feel work overload, Does not feel treated unjustly)

not feel this way (OR 0.604). Having an overwhelming amount of duties and being treated unjustly at work have an even stronger effect on this group, decreasing their odds of achieving job satisfaction almost by half (OR 0.580 and 0.533, respectively).

In the case of knowledge workers, a precarious income source, an overload of duties and unfair treatment are strongly influential variables. Permanent knowledge workers who consider their income to be uncertain have over 60 % (OR 0.381) lower odds of obtaining satisfaction than the ones who do not feel this way. The odds of being satisfied or very satisfied for income insecure own-account knowledge workers are lower by almost 95 % in comparison to own-account workers who feel financially secure (OR 0.063)—the OR for income insecure own-account knowledge workers was obtained by multiplying the exponentiated estimate of Income Source Uncertain (OR 0.381) and interaction term Own-Account × Income Source Uncertain [Exp(B) = 0.166]. Knowledge workers who believe they are treated unjustly are even less likely to be satisfied with their jobs (OR 0.343). The sense of powerlessness, represented by having too many duties to cope with also impacts the job satisfaction of knowledge workers, but the strength of the impact is lower. Knowledge workers who struggle with this issue are almost 20 % (OR 0.819) less likely to be satisfied or very satisfied with the job than the individuals from this group who do not deal with this problem.

6 Conclusions

The hypothesis H1, stating that job security positively impacts job satisfaction, regardless of the type of contract, has been rejected. Individuals with flexible employment contracts, in particular own-account workers, are more sensitive to job precarity. Interestingly, the employment flexibility effect is only present in the group of knowledge workers. Thus, it is especially important to guarantee legislative and job security to persons from the knowledge sector. Together with the finding that own-account knowledge workers are more likely to be satisfied with their jobs than the permanent workers under the condition of income source security, it could be an argument in favour of flexicurity. However, a huge emphasis should be put on the security dimension, especially that great majority of own-account workers reports financial insecurity. As it is difficult for authorities to manage job security, even more efforts should be made to guarantee employment security. In the analysis we showed that a sense of income source precarity, which is semantically the closest to employment insecurity, is a distressing aspect for workers with flexible working arrangements. Flexible employment is a favourable option for knowledge workers if and only if job and employment security are assured.

Austerity measures, on the other hand, aiming to limit security of flexible employment arrangements, would come against the idea of flexicurity and would make flexible employment inferior to permanent positions. The analysis has shown that in the case of knowledge workers, the insecure self-employed are still better off, in terms of job satisfaction, than the permanent workers with the same problem. However the insecure own-account workers are worse off than permanent secure workers. Taking into account that over 70 % of own-account knowledge workers feel insecure compared to 40 % (50 % in 2013) of permanent knowledge workers, reassuring employment security in flexible employment is a vital issue for the well-being of knowledge workers. For that reason an important aspect of government policy with respect to the labour market is keeping legislative security at a satisfying level.

The derived model confirms hypothesis H2 concerning the higher job satisfaction of knowledge workers with more flexible job contracts. Knowledge workers are more likely to attain job satisfaction working on their own account instead of having a permanent contract. This finding proves that, despite the common view, flexible employment is not necessarily worse than the permanent contract. Therefore, temporary contracts and self-employment play an important role in employment policy and should not be disregarded as inferior. More detailed analysis on subgroups of workers could possibly show which occupational groups in fact feel more comfortable with more flexible arrangements and which groups are facing the problem of precarity. It is an important idea for future research as it would help policy-makers tailor their employment policies.

Own-account knowledge workers have been proven to be more likely satisfied than permanent workers. This kind of working arrangement provides more liberty and job flexibility to the workers. The realisation of one's goal as an own-account worker is easier than under other employment arrangements. If one has more freedom to determine the various aspects of one's job, the gap between job expectations and the reality may be smaller, than in the case of other employed individuals. However own-account workers are also the group which is affected by financial insecurity the most.

Hypothesis H3 stating that the job satisfaction of knowledge workers is less influenced by a lack of job security than job satisfaction of other workers, has been only partly confirmed. The job satisfaction of knowledge workers is less influenced by an overload of duties than the group of other workers, as hypothesised in H3b. However, the other symptoms of job insecurity (financial uncertainty and hostile relations at work) affect knowledge workers with more strength than the other group, thus H3a and H3c have been rejected. The explanation behind the stronger influence of job insecurity on the satisfaction of knowledge workers may be sought in the discrepancy theory. We can interpret the results as the difference in expectations with regards to the job security among the analysed groups. Other workers, especially precarious temporary workers, *expect* their work to be insecure, so this factor does not change the difference between their job expectations and the actual job. Knowledge workers on the other hand may have higher expectations towards their security. According to the discrepancy theory, a factor highly valued by an individual is more likely to affect his or her job satisfaction. Hence, the result shows that knowledge workers not only expect their job security to be higher but also greatly value this psychological comfort at work. The lack of it affects their job satisfaction to a great extent. Also in this case, analysis on disaggregated data could give an interesting insight into the issue. It is possible that the importance of job security concerns only some subgroups of knowledge workers, whereas others, such as the ones that appreciate mobility more, do not pay much attention to it.

The analysis has shown that job security is a crucial factor in determining job satisfaction for both knowledge workers and other workers. It is also the key ingredient in the flexicurity mix. The type of contract should not depreciate the job satisfaction of an individual, provided he or she does not feel that their position is at risk. Job security is also very important for seemingly indifferent knowledge workers, who, one would assume, can easily find alternative employment. Thus, providing employees with a basis for feeling secure is vital for their satisfaction. Although job satisfaction has not been proven to improve workers performance, it brings a number of other benefits (e.g. lower rates of grievances, absenteeism and quits) that are undoubtedly valuable for employers.

An important further step in the analysis of employment flexibility and job security and their impact on job satisfaction is to investigate changes in time on the individual level, with the inclusion of macroeconomic factors as potential determinants. Also, a fruitful area

for future research would be to investigate other types of flexibility-security nexuses. In particular, the employment flexibility and employment security nexus should be an important consideration for future research, as it is a factor that may be influenced by government policies. Another significant factor in the context of knowledge workers is work-time flexibility and its influence on job and life satisfaction. It would be an interesting development of the topic to investigate how flexible working hours and other work arrangements impact the job satisfaction of different types of workers.

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