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184

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OF JOB
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IN EUROPE*

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ABSTRACT

The study explores the empirical determination of perceived job instability in European labour markets. The study is based on the large-scale survey from the year 1998 covering the 15 member states of the European Union and Norway. There are evidently large differences in the amount of perceived job instability from country to country. The lowest level of perceived job instability is in Denmark (9%). In contrast, the highest level of perceived job instability is in Spain (63%). The results show that perceived job instability increases with age. Educational level, on the other hand, does not correlate strongly with the perception of job instability. There are no differences in the perceptions of job instability between males and females. An occurrence of unemployment during the past five years yields a substantial rise in the perception of job instability. The empirical finding that unemployment history strongly matters for the perception of job instability is consistent with the notion that an unemployment episode provides otherwise private information about unobservable productivity of an employee. The most striking result is that a temporary contract as such does not yield an additional increase to the perception of job instability at the individual level of the economy. However, the perception of job instability is more common within manufacturing industries. In addition, the perception of job instability by employees increases according to the size of the firm. There are also strong country effects.

TIIVISTELMÄ

Tutkimuksessa tarkastellaan empiirisesti tekijöitä, jotka vaikuttavat työntekijöiden huolestuneisuuteen työpaikkansa pysyvyydestä Euroopan työmarkkinoilla. Tutkimus perustuu laajaan kyselyaineistoon vuodelta 1998, joka kattaa Euroopan Unionin kaikki jäsenmaat sekä Norjan. Maiden välillä on suuria eroja työntekijöiden huolestuneisuudessa työpaikkansa pysyvyydestä. Vähäsinä huolestuneisuus on Tanskassa (jossa ainoastaan yhdeksän prosenttia kaikista työntekijöistä on huolissaan työpaikkansa pysyvyydestä). Yleisintä huolestuneisuus on sitä vastoin Espanjassa (jossa peräti 63 prosenttia työntekijöistä on huolissaan työpaikkansa pysyvyydestä). Tulosten mukaan huolestuneisuus työpaikan pysyvyydestä kasvaa iän myötä Euroopassa. Koulutuksella ei ole juurikaan vaikutusta huolestuneisuuteen. Miesten ja naisten välillä ei ole eroja huolestuneisuudessa työpaikan pysyvyydessä. Aiempi työttömyysjakso kasvattaa huolestuneisuutta työpaikan pysyvyydestä. Työttömyyshistorian vaikutus huolestuneisuuteen on sopuosinnussa sen kanssa, että työttömyysjakso paljastaa muutoin yksityistä informaatiota työntekijän tuottavuudesta. Määräaikaisella työsuhteella ei ole itsessään vaikutusta huolestuneisuuteen työpaikan pysyvyydestä yksilötasolla. Työntekijöiden huolestuneisuus työpaikkansa pysyvyydestä on yleisempää teollisuudessa. Lisäksi työntekijät ovat enemmän huolestuneita työpaikkansa pysyvyydestä suurissa yrityksissä. Euroopan Unionin maiden välillä on huomattavia eroja työntekijöiden huolestuneisuudessa työpaikkansa pysyvyydestä myös vakioitaessa yksilötekijöitä, jotka vaikuttavat huolestuneisuuteen.

1. INTRODUCTION

The empirical evidence on the dynamics of labour demand by firms suggests that market economies are definitely in a state of continuous turbulence. Each year, on the one hand, many businesses expand (and succeed), while, on the other hand, many others contract (and fail). Joseph A. Schumpeter (1942) called this underlying process of capitalism by the expression “creative destruction”. The reallocation and the reorganisation of resources therefore culminates in the functioning of labour markets, where the reallocation of scarce resources takes the form of gross job and worker flows¹. The magnitude of these gross flows is enormous in comparison to the net rate of employment change. Davis and Haltiwanger (1999) report that in most Western economies roughly ten per cent of jobs are created/destroyed each year. Gross worker flows are even larger in magnitude. Gottschalk and Moffitt (1998) stress that the implicit normative assumption behind much of the public discussion of job and worker turnover is that turnover is undesirable, because it is either “involuntary” or leads to worsened outcomes, such as an increase in the probability of unemployment or a decrease in wages.

However, this apparent job instability implied by the enormous magnitude of job turnover and gross worker flows is not as such a malaise, because a large part of the gross worker flows is, in fact, inherently voluntary by nature. For example, the voluntary turnover of workers is often related to career concerns of individuals. In fact, this feature of labour markets suggests that the realized patterns of gross job and worker turnover and the perception of job instability among workers are not necessarily closely correlated with each other. However, the perception of job instability is closely linked to the underlying welfare of individuals, which should be the ultimate focus of any economic policy exercise. This is due to the fact that for the large majority of employees only one match with an employer comprises most of the current earnings, making their welfare closely related to the potential risk of losing their job². This means that it is indeed interesting to investigate

¹ Davis and Haltiwanger (1999) provide a survey of the literature on gross job and worker flows. Burda and Wyplosz (1994) provide empirical evidence on the magnitude of gross job and worker flows in Europe.

² In addition, Aaronson and Sullivan (1998) argue that the trends in job security are much more relevant to the discussion of whether special factors might be restraining wage inflation than are the

what the most important underlying fundamentals that determine the distribution of the perception of job instability from individual to individual are. By doing this, the following empirical investigation complements the picture of European labour markets painted by a large number of recent empirical studies on gross job and worker flows.

The aim of this study is therefore to investigate the empirical determination of the subjective probability of job instability from individual to individual by using unique survey data from all the 15 member states of the European Union and Norway³. This means that the following study provides detailed empirical evidence, for example, on the individual characteristics such as age and education that are related to the perceived job instability of individuals in European labour markets. In addition, the study includes a consideration of job and firm characteristics and their role in the determination of the perception of job instability. In other words, this unexploited data makes it possible to evaluate the whole spectrum of economic fundamentals that give rise to the perception of job instability among European workers. The following empirical results are indeed somewhat different with respect to ones obtained recently by using U.S. surveys. Thus, the study is able to contribute to the discussion on the differences of European-style labour markets compared with the U.S. labour markets⁴.

This study appears in five parts. The first part of the study provides a brief overview of earlier empirical investigations into the perceived job instability of individuals. The motivation of the selected variables in the estimated equation is therefore broadly based on previous empirical literature on the incidence of perceived job instability at the individual level of the economy. The second part provides a description of individual-level survey data that is used to assess the current characteristics of job instability in the context of European labour markets. The third part of the study provides a detailed analysis of the

trends in realized job stability. In particular, if declines in job stability are less dramatic than declines in job security, it must largely be because workers are less likely to leave jobs voluntarily, and a decreased tendency to quit jobs may itself signal worker insecurity.

³ The survey was commissioned by the European Foundation for the Improvement of Living and Working Conditions, Dublin, and the Norwegian Royal Ministry of Labour and Government Administration, Oslo. Fieldwork was co-ordinated by Infratest Burke Sozialforschung, which also prepared the initial analyses of the survey.

⁴ Alesina *et al.* (2001) provide a recent study on the differences of European and U.S. welfare systems.

incidence of perceived job instability by applying Probit models. In addition, the section contains an elaboration of the robustness of the empirical patterns of perception of job instability. The fourth part concludes with some reflections. Finally, the last part of the study includes a discussion of the potential implications of perception of job instability among workers.

2. PREVIOUS RELATED STUDIES

There has indeed been a great number of empirical studies on job instability that aim to document and investigate the realized patterns of job instability⁵. However, there is a rather limited number of empirical investigations that aim to investigate the empirical determination of perceived job instability from individual to individual. The latter studies require detailed survey data. The neglect of perceived job instability is at least partly related to the fact that economists are usually sceptical about the use of this kind of survey data due to measurement problems⁶. In addition, the focus of available empirical literature on perceived job instability has been heavily on the unregulated Anglo-Saxon labour markets. Thus, the following investigation concerning the determination of perceived job instability in all the 15 member states of the European Union and Norway provides an interesting opportunity for cross-country comparison and fills an important gap in the earlier literature⁷.

⁵ Neumark, Polsky and Hansen (1999) summarize the evidence on job instability in the United States. OECD (1997) provide empirical evidence on the evolution and the causes of job instability for Europe. In addition, Givord and Maurin (2001) provide recent evidence on the rise in magnitude of job instability in France. Nätti et al. (2001) investigate the determination of perception of job instability in Finland. They found out that a lack of optimism is the best predictor for the incidence of perception of job instability for the period of 1999–2000.

⁶ In particular, Berthard and Mullainathan (2001) provide empirical evidence on the issue that the measurement error of often applied surveys tends to correlate with a large number of characteristics of individuals (such as education). Van Praag *et al.* (2001) provide a survey of the field. Of course, there is a long tradition of analysis applying subjective survey responses within psychology. On the other hand, within labour economics, it is common to utilize various labour force surveys, but usually economists are not focused on the investigation of the subjective views of individuals.

⁷ OECD (1997) provides a breakdown of perceived job insecurity in Europe based on Eurobarometer Survey for 1996. Blanchflower and Oswald (1999) provide an investigation into

The perception of job insecurity is indeed a fact of life and it is not possible to remove a major part of job instability by holding a diversified portfolio of publicly traded assets. For example, Davis and Willen (1999) have studied the correlation between earnings shocks and asset returns in the context of the U.S. labour markets. According to the results, the correlation between returns on the S&P 500 and earnings shocks exceeds 0.4 for older, college-educated women, ranges from 0.1 to 0.3 over most of the life cycle for college-educated men and is roughly -0.25 for men who did not finish high school. This means that trade in a broad-based equity index enables individuals to hedge only a small portion of the group-level earnings risk induced by the underlying heterogeneity of individuals.

There has been a lively discussion on the issue of perceived job instability in the U.S. Schmidt (1999) provides empirical evidence for the commonly held view that there has been a rise in the perception of job loss among workers as a whole during the 1990s. Aaronson and Sullivan (1998) present empirical evidence of individual characteristics that are related to the incidence of job insecurity. Dominitz and Manski (1996), and Gottschalk and Moffitt (1998) present additional empirical evidence. Manski and Straub (2000) provide the most recent detailed investigation on the issue. Worker perceptions of job insecurity peaked in 1995⁸. According to the results concerning individual characteristics of American workers, the expectations of job insecurity are not related to the age of individuals. Subjective probabilities of job loss tend to decline with additional years of schooling, which is strongly in line with common sense⁹. In other words, education seems to provide at least a partial "shield" against job instability in the U.S. labour markets. In addition, the perceptions of job loss vary little by gender. However, the subjective probability of job loss among black people is almost double that of white people.

The UK empirical evidence in terms of perceived job instability can be summarized as follows. Green, Felstead and Burchell (2000) provide empirical evidence for the view that

job insecurity by applying ISSP (International Social Survey Program) including a large group of countries. In addition, Domenighetti et al. (1999) provide empirical evidence for the view that job insecurity generates substantial negative health effects (for example, sleeplessness).

⁸ Aaronson and Sullivan (1998) provide additional evidence on this issue.

⁹ However, the empirical evidence presented by Aaronson and Sullivan (1998) reveals that an increase in the perceived likelihood of job loss has been especially great among white-collar workers during the 1990s. Thus, there has been a kind of "democratization" of job insecurity in the U.S.

the perceived risk of job loss, in aggregate, changed rather little between 1986 and 1997 in the UK. Green *et al.* (2000) further show that the overall perception of job insecurity was fairly stable between 1996 and 1997, but it did indeed rise, relative to the overall rate of unemployment, which was substantially lower in 1997 than in 1996. There has also been the same kind of redistribution of job insecurity as in the U.S. (i.e. professional workers have become much more insecure about the jobs they hold). In particular, the results reported by Green *et al.* (2000) indicate that unions have no observable impact on the magnitude of job insecurity. In addition, Green *et al.* (2001) provide detailed empirical evidence on the determination of perception of job loss. The perception of job loss is definitely common in the UK. Thus, in 1996 and 1997, approximately 1 in 10 British workers thought that it was either likely or very likely that they would lose their job within 12 months.

However, Green *et al.* (2001) argue that workers tend to overestimate the likelihood of job loss. In particular, the empirical investigation of the perception of job instability by Green *et al.* (2001) includes four sets of potential determinants: the workers' personal unemployment experience and environment, the objective characteristics of the jobs they hold, human capital indicators and, finally, relevant attitudinal variables. The empirical results presented by Green *et al.* (2001) indicate that the past unemployment experience increases the subjective probability of job loss among men. The increase in the regional unemployment rate yields a rise in the subjective probability of job loss. In addition, the perception of job insecurity is not related to the establishment size. The older workers express higher levels of job insecurity. The attitudinal variables included are also important in the determination of the perception of job instability. The empirical evidence therefore indicates that job dissatisfaction is strongly associated with job insecurity in the UK¹⁰.

¹⁰ Green *et al.* (2001) also find that increased job insecurity, relative to aggregate unemployment rate, has contributed in part to wage restraint in the UK. Aaronson and Sullivan (1998) have earlier reported similar empirical results for the U.S. by using General Social Survey (GSS). Nickell, Jones and Quintini (2000) provide additional evidence on the issue of job insecurity in the UK.

3. THE DATA

The data of this study is drawn from a large-scale survey (Employment Options for the Future). The survey covers the 15 European Union members and Norway¹¹. The survey was originally designed to find out who wanted to work and who did not want to work. Thus, the major strength of the survey is that it contains a great number of detailed questions about the underlying preferences of individuals with respect to labour market conditions in Europe. In addition, the survey also includes more detailed information than has been typical in the earlier investigations about job characteristics, which has a potential role in the empirical determination of the perception of job instability. The survey was conducted in 1998 and it was framed for the residential population aged from 16 to 64 years. The fieldwork was carried out between May and September 1998 in all 16 countries included.

The survey was done for about 1500 individuals for most of the countries included in Europe. Appendix A contains the tabulation of the number of interviews in each country included in the survey. However, the individuals unemployed at the time of the interview are omitted from the data, because the perception of job instability is not relevant for those persons¹². In addition, the following analysis includes only employees. In other words, self-employed persons are omitted from the following analysis of the perceived job instability due to the notion that the empirical determination of the perception of job instability ought to be different among them with respect to employees¹³. This means that the data that is used in the following estimations covers 3123 persons after also eliminating a small number of inconsistent answers to the questions of the survey.

The key variable of the survey from the point of view of this study is, of course, the perception of job instability at the individual level of the economy. This question of the

¹¹ Infratest Burke Sozialforschung (1999a, 1999b, 1999c, 1999d) provides the detailed documentation of the survey.

¹² The total number of telephone assisted interviews was 30557. The number of non-employed individuals was 17908.

¹³ Self-employed persons are defined as persons who declare themselves to be self-employed. In addition, the size of company is not available for all employees. The effect of this limitation of the survey data is discussed in the section on the robustness of the reported results.

survey is formulated as follows: "Do you worry about the security of your present work?". In particular, in the conduct of the survey the notion that "job security" was equal to "job stability" was heavily underlined. The answers to the question can either be "yes" or "no". This feature of the survey is actually a strength from the point of view of the following analysis, because it can be argued that there is more confusion among interviewees when it is possible to choose from among multiple degrees of subjective job instability¹⁴. One potential problem of the applied question of the survey is that it does not define the exact time span of fear about job instability. However, the following analysis of the survey also includes a number of variables (such as education) that can broadly be interpreted as indicators of the individuals' time preference.

The basic distribution of perceived job instability in Europe based on the applied survey of this study is shown in Table 1. There are indeed large differences in the amount of perceived job instability from country to country. The lowest level of perceived job instability is in Denmark (9%). In contrast, the highest level of perceived job instability is in Spain (63%). According to the survey, the perception of job instability is more common in the UK than the empirical results reported in Green *et al.* (2001) indicate for 1997 and 1998.

The average unemployment rate in the countries included in the survey is in positive association with the perception of job instability (Figure 1). The underlying correlation of perception of job instability and the unemployment rate is in line with the recent notions based on gross flows of jobs and workers, because the rate of worker outflow into unemployment tends to be at the higher level in the segments of the economy that are characterized by the high unemployment rate. However, the correlation of perception of job instability and the unemployment rate is far from perfect across the countries of the survey¹⁵. Thus, there tends to be about the same amount of perceived job instability among workers despite the fact that the average unemployment rate is far from equal in certain pairs of countries. For instance, the perception of job instability among employed

¹⁴ Green *et al.* (2001) apply the British Household Panel Survey (BHPS), in which it is possible to choose from among multiple degrees of subjective job instability.

¹⁵ Green *et al.* (2001) present similar scatterplots by using the International Social Survey Programme (ISSP) and find that there is a positive association between job insecurity and the aggregate unemployment rate across countries.

workers is at about the same level in Finland and Norway despite the fact that the unemployment rate was 11.4% in Finland in 1998 and only 3.2% in Norway.

Figures 2–3 relate the incidence of job instability to the strictness of labour standards and to the strictness of employment protection¹⁶. These figures are not consistent with the popular notion that the perception of job instability declines as the strictness of labour standards and the strictness of employment protection increase in European labour markets¹⁷. This pattern emerges despite the stylized feature of the literature that the underlying magnitude of gross job and worker flows of the economies declines as the strictness of labour standards and employment protection increases¹⁸.

In addition, Figure 4 depicts the relationship between the incidence of the perception of job instability and the replacement rate across countries¹⁹. There therefore seems to be some weak empirical evidence for the view that the perception of job instability is at the lower level in the countries that have high replacement rates. In particular, in the UK there is a low replacement rate and also a high level of the perception of job instability compared with the Nordic countries.

The survey includes a great number of individual characteristics and other variables that facilitate the investigation of the determination of the perceived job instability in Europe.

¹⁶ Greece and Luxembourg are excluded from Figures 2-3 due to the fact that indexes of labour standards and employment protection are not available for these countries. These indexes are adapted from Nickell and Layard (1999, 3040). The index of labour standard strictness is originally by OECD. Each country is scored from 0 (lax or no legislation) to 2 (strict legislation) on five dimensions: working hours, fixed-term contracts, employment protection, minimum wages and employees' representation rights. The scores are then totalled, generating an index ranging from 0 to 10. The OECD employment protection index is based on the strength of the legal framework governing hiring and firing of workers. Countries are ranked from 1 to 20, with 20 being the most strictly regulated.

¹⁷ Another possible interpretation of the correlation is that the demand for employment protection rises if there is a great deal of perception of job instability among employees. Agell (1999) provides an elaboration along this line of thinking.

¹⁸ Bertola (1992) and Garibaldi (1998) provide presentations of this view of labour market adjustment.

¹⁹ Greece is excluded from the figure owing to the fact that the replacement rate is not available for that particular country. The replacement rates are adapted from OECD (1998) and calculated as an average of the first four columns in Table 3.1, which report replacement rates for four family types (i.e. single, married couple, couple with two children and lone parent with two children).

The applied variables of the following analysis are summarized in Table 2. In addition, Appendix B provides summary statistics of the most important variables. Most of the applied variables are (almost) self-evident. The variables are divided into three broad categories. Thus, there are variables that characterize (i) individuals (such as education), (ii) jobs that individuals hold (such as the number of jobs that an individual currently holds) and also (iii) variables that capture some key characteristics of firms (such as the size of the company at which the individual is currently working). In addition, the following Probit models include country dummies owing to the fact that there are evidently large differences in the perceived job instability from country to country in Europe.

Table 1. The frequency of worry about the security of one's present work in Europe (i.e. an answer to the question: "Do you worry about the security of your present work?"). "UN" refers to the standardized unemployment rate in 1998 (Source: OECD 1997)

Country	"YES"	"NO"	UN* (%)
Austria	23	77	6.4
Belgium	25	75	11.7
Denmark	9.0	90	6.3
Finland	17	83	11.4
France	28	72	11.8
Germany	36	63	11.2
Greece	60	39	10.1
Ireland	19	81	7.7
Italy	48	52	12.2
Luxembourg	22	78	3.1
Netherlands	20	80	4.2
Portugal	12	84	5.0
Spain	63	36	18.8
Sweden	20	80	6.5
United Kingdom	26	74	6.2
Norway	15	85	3.2

Figure 1. A scatterplot of "yes" answers (to the question: "Do you worry about the security of your present work?") and the standardized unemployment rate (UN) in 1998 in European countries

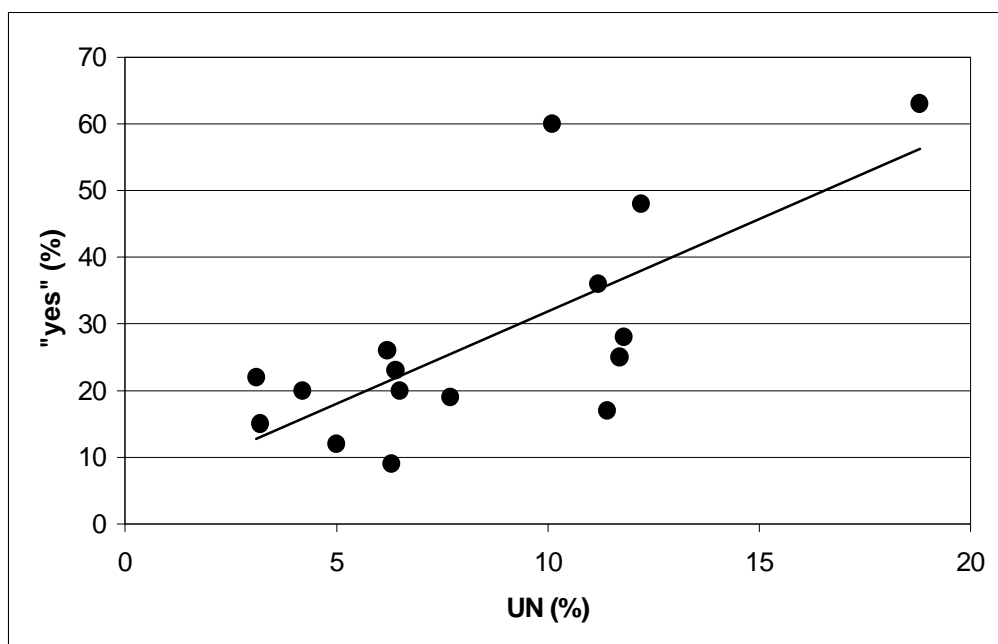


Figure 2. A scatterplot of "yes" answers (to the question: "Do you worry about the security of your present work?") and an index of labour standards (Source: Nickell & Layard 1999)

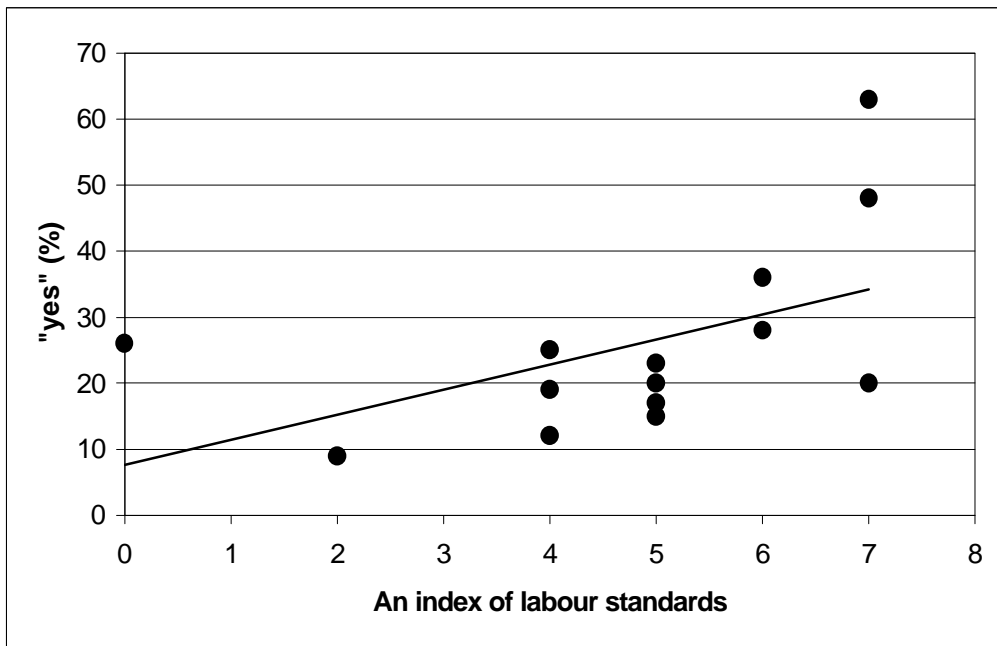


Figure 3. A scatterplot of "yes" answers (to the question: "Do you worry about the security of your present work?") and an index of employment protection (Source: Nickell & Layard 1999)

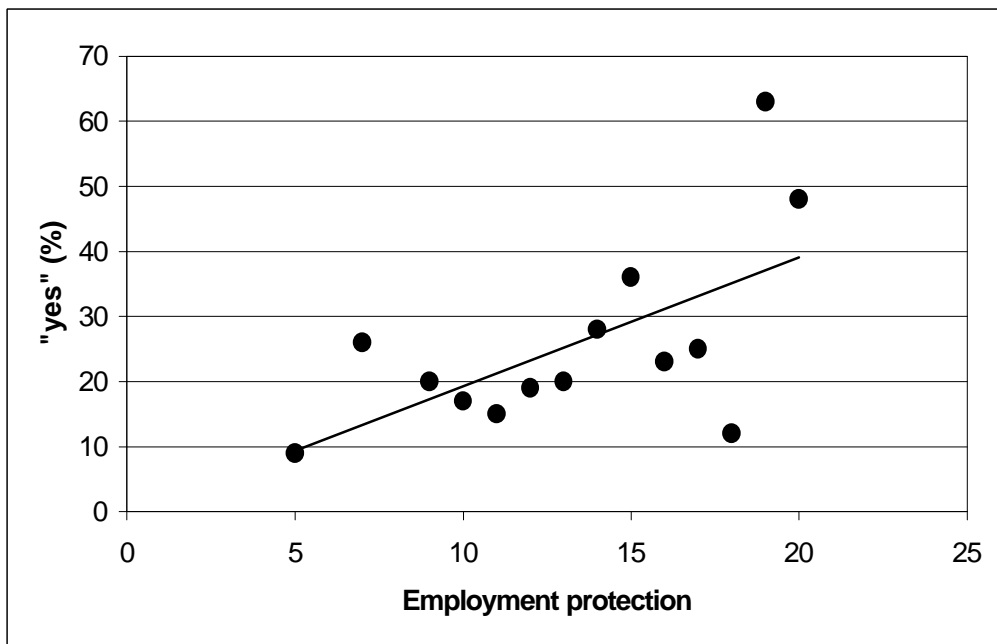


Figure 4. A scatterplot of "yes"-answer (to the question: "Do you worry about the security of your present work?") and an index of the replacement rate (Source: OECD 1998)

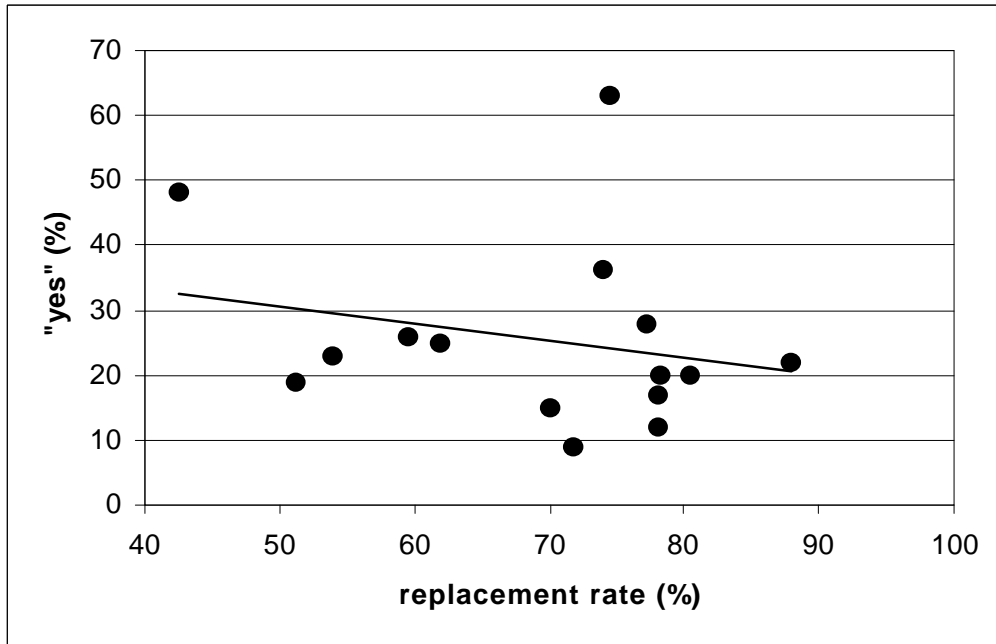


Table 2. The description of the selected variables

Variable	Definition/measurement
<i>Individual characteristics:</i>	
WORRIED	Individual is worried about the security of his/her present job= 1, otherwise=0
AGE	Age of an employee
AGE ²	AGE squared
GENDER	1= male, 0= female
DEGREE	Individual has a university degree/college degree= 1, otherwise=0
MARRIED	Individual is married= 1, otherwise= 0
PARTNER	Partner is not currently in paid work= 1, otherwise=0
CHILDREN	Individual has children= 1, otherwise=0
EXPERIENCE	Individual has been in paid work over 10 years= 1, otherwise=0
TENURE	Individual has worked over 10 years for current employer= 1, otherwise=0
UNEMPLOYED	Individual has been unemployed during the past five years= 1, otherwise=0
GENOPTIMISTIC	Individual thinks that the general economic situation is currently 'very good'= 1, otherwise= 0
PEROPTIMISTIC	Individual thinks that his/her personal economic situation is currently 'very good'= 1, otherwise= 0
<i>Job characteristics:</i>	
JOBS	Individual has currently only one job= 1, otherwise= 0
HOME	Individual would like to work at home= 1, otherwise= 0
PART	Individual has currently a part-time job= 1, otherwise= 0
OVERTIME	Individual has recently done paid or unpaid overtime= 1, otherwise= 0
TEMPORARY	Individual has currently a temporary contract= 1, otherwise= 0
MANUAL	Individual has a manual job= 1, otherwise= 0
MANAGER	Individual has managerial duties in his/her current job= 1, otherwise= 0
HOURS	The number of hours that individual works per week on average
METROPOLITAN	Individual is living in or close to a large city with more than 100 000 inhabitants= 1, otherwise= 0
<i>Firm characteristics:</i>	
MANU	Individual is currently employed in manufacturing industries (including mining and construction)= 1, otherwise= 0
SERVICE	Individual is currently employed in service sectors (including public services)= 1, otherwise= 0
SIZE1	Size of company measured by the number of employees is less than 9= 1, otherwise= 0
SIZE2	Size of company measured by the number of employees is from 10 to 49= 1, otherwise= 0
SIZE3	Size of company measured by the number of employees is from 50 to 499, otherwise= 0
SIZE4	Size of company measured by the number of employees is more than 500= 1, otherwise= 0 (reference)
<i>Country dummy variables:</i>	
AUSTRIA	Individual is currently living in Austria= 1, otherwise= 0
BELGIUM	Individual is currently living in Belgium= 1, otherwise= 0
DENMARK	Individual is currently living in Demark= 1, otherwise= 0
FINLAND	Individual is currently living in Finland= 1, otherwise= 0
FRANCE	Individual is currently living in France= 1, otherwise= 0
GERMANY	Individual is currently living in Germany= 1, otherwise= 0
GREECE	Individual is currently living in Greece= 1, otherwise= 0
IRELAND	Individual is currently living in Ireland= 1, otherwise= 0

ITALY	Individual is currently living in Italy= 1, otherwise= 0
LUXEMBOURG	Individual is currently living in Luxembourg= 1, otherwise= 0
NETHERLANDS	Individual is currently living in the Netherlands= 1, otherwise= 0
PORTUGAL	Individual is currently living in Portugal= 1, otherwise= 0
SPAIN	Individual is currently living in Spain= 1, otherwise= 0
SWEDEN	Individual is currently living in Sweden= 1, otherwise= 0
UNITED KINGDOM	Individual is currently living in the United Kingdom= 1, otherwise= 0
NORWAY	Individual is currently living in Norway= 1, otherwise= 0 (reference)

4. THE RESULTS

Owing to the fact that the applied variable WORRIED can, by definition, have only two values (0 or 1), it is convenient to estimate a Probit specification as follows²⁰:

$$(1) \quad \text{Prob}(\text{WORRIED}_i = 1) = \Phi(\beta' \mathbf{x}) + \varepsilon_i,$$

where WORRIED_i is a dichotomous variable obtaining the values of an answer to the question: "Do you worry about the security of your present work?" for the individual i of the survey. Thus, if WORRIED_i is 1, then an individual is worried about his/her present job, and if WORRIED_i is 0, then an individual is not worried about his/her present job. \mathbf{x} is a vector of explanatory variables, β is a vector of the estimated coefficients and Φ is the cumulative standard normal distribution function. ε_i is a normally distributed error term with mean 0 and variance σ^2 .

The estimation results are summarized in Tables 3a-3b. The following assessment of the estimation results is focused on the results that cover the whole population (reported in Table 3a). The probit model was also estimated separately for the subpopulation of

²⁰ Horowitz and Savin (2001) provide a survey of binary response models.

females²¹ (reported in Table 3b). This is due to the fact females hold quite different jobs compared with the jobs that are held by males. Especially, most of the part-time workers included in the survey are females.

The individual characteristics are obviously an important element in the empirical determination of the perception of job instability in Europe. In particular, the results reveal that the perception of job instability is indeed higher among older workers than among young workers despite the stylized feature of labour markets that the turnover of jobs and workers is more intensive among young employees²². The results are therefore consistent with the popular notion that job instability is more of a problem for aged employees and that the turnover of jobs among young employees is mainly due to the voluntary quits, which are often related to career concerns. The result is also in line with a recent investigation by Blanchflower and Oswald (1999), according to which there is an increase in the perception of job insecurity as an employee ages. In addition, the observation is in line with the stylized fact that job displacements tend to cause much larger wage losses for the older worker (see, for example, Kuhn 2001). This variation of wage losses across age groups of workers may reflect the feature that a greater fraction of older workers' skills are specific to an occupation or industry, thus exposing them to a much "thinner" labour market, compared with the young workers with more general labour market engagement.

There are no differences in the perceptions of job instability between males and females. This result is nicely in line with observations by Manski and Straub (2000) for the U.S., Green *et al.* (2001) for the UK and OECD (1997) for Europe, but in disagreement with an empirical study by Clark (1997), according to which males rank job security more highly than females, applying the British Household Panel Survey.

The perception of job instability does not decline as an individual gets additional years of schooling. In other words, education does not yield a kind of "shield" against job instability in Europe. This particular result is not in line with earlier empirical studies from

²¹ A limited number of observations does not make it possible to estimate the specifications separately for each country of the survey.

²² Ryan (2001) provides a survey of these issues.

Anglo-Saxon labour markets elaborated in the earlier section of this study. In other words, the European labour markets, as a whole, and the Anglo-Saxon labour markets seem to be dissimilar in this respect. The breakdown of job insecurity by OECD (1997) reveals some weak empirical evidence for the view that there are differences in the perception of job instability based on the years of education in Europe²³.

In principle, there should be less perception of job instability if an individual is married and, in particular, if the partner is currently in paid work. This is due to the fact that the partner's income provides at least a partial shield against job insecurity in the presence of imperfect private insurance markets. However, the estimation results are not in line with this line of thinking. In addition, the results do not support the view that the presence of children increases the perception of job instability. In principle, the perception of job instability, other things being equal, should rise if the individual has children, because children's wellbeing is almost totally dependent on the stability of their parents' income stream. The hypothesis that the presence of children should, other things being equal, yield an increase in the perception of job instability does not hold even for the subpopulation of females (see Table 3b).

According to the results, a long attachment to labour markets in terms of general experience delivers a decline in perceived job instability, which is strongly in line with common sense. The conventional wisdom says that job tenure can be considered to be a proxy variable for the firm-specific human capital of individuals. This means that a long tenure should yield a decrease in job instability at the individual level of the economy, because firms typically follow the policy of "last in, first out". In fact, Green *et al.* (2000) provide empirical evidence for this kind of reasoning in the context of the UK. However, the results indicate that a long tenure (i.e. a long-term attachment to the same firm of the economy) does not yield a decline in the perception of job instability in European labour markets²⁴. In other words, the results are therefore in keeping with view that human capital is mostly general by its nature.

²³ However, the measure of education in the investigation by OECD (1997) is far from perfect, because education is proxied by the age at which the individual first left full-time education.

²⁴ This result is not in line with a stylized fact in the literature on gross worker flows, according to which the probability of a job ending, in fact, declines with tenure (see, Farber 1999). A potential

An occurrence of unemployment during the past five years yields a substantial rise in the perception of job instability. The result is closely in line with the recent observations by Green *et al.* (2001) for the UK. In addition, Aaronson and Sullivan (1998) have discovered that individuals that have previously had an unemployment period are more prone to job insecurity in the U.S. labour markets²⁵. In principle, there can be both real and psychological reasons for this correlation. The real reasons arise from the fact that there is an episode of deaccumulation of human capital during the periods of unemployment. The occurrence of unemployment therefore yields a decline in the future probability of finding a job. On the other hand, the psychological effects are based on the notion that past experience tends to heighten the "availability" of that particular option to the individual²⁶. In addition, the result concerning the effect of past unemployment on the perception of job instability is connected to the emerging economic literature that stresses the notion that unemployment is a significant contributor to the unhappiness of individuals across industrialized countries (see, for example, Di Tella *et al.* 2001). A part of the contribution of unemployment to unhappiness can therefore be realized via the increase in the perception of job instability in the case that individuals are risk-aversers.

The empirical finding that unemployment history strongly matters for the perception of job instability is also consistent with the notion that an unemployment episode provides otherwise private information about unobservable productivity of an employee. Thus, a layoff of individual worker in contrast to a quit or a closure of whole plant is indeed a credible signal about low-productivity of an employee (see, for example, Gibbons and Katz 1991). This means that unemployment tends to bring future unemployment at the individual-level of the economy (see, for example, Arulampalam *et al.* 2001). The welfare losses associated with unemployment episodes can manifest in extreme form. In fact,

problem with the conclusion that a long tenure does not yield a decline in the perception of job instability is the fact that the age of an employee and the length of the tenure tend to be positively correlated across individuals.

²⁵ A related study by Ruhm (1991) finds that job losers continue to experience lasting wage reductions in the U.S. This suggests that there are significant worker attachments to specific jobs. In addition, Hall (1995) focuses on the permanent effects of job losses in the U.S. Kletzer (1998) provides a summary of empirical findings.

²⁶ Tversky and Kahneman (1982) provide a discussion of these effects.

Charles and Stephens (2001) observe that a layoff yields an increase in the future divorce probability of individuals in the U.S.

The results further reveal that an optimistic view of the general economic conditions in the country of an individual has no effect at all on the perception of job instability, but an optimistic view about one's personal economic conditions is associated with a decline in perception of job instability. The estimation results therefore underline the view that the perception of job instability is deeply a personal matter.

There are a number of job characteristics that are essential in the determination of the perception of job instability in the context of the European labour markets. In principle, the fact that an individual holds more than just one current job should decrease the perception of job instability, because the presence of multiple jobs should diversify various risks induced by labour markets, owing to the fact that the idiosyncratic shocks that affect these jobs are not perfectly correlated with each other²⁷. However, this line of reasoning is not in line with the estimation results.

Green *et al.* (2001) observe that the various measures of job dissatisfaction are positively related to the perception of job instability in the unregulated UK labour markets. In addition, Blanchflower and Oswald (1999) discover out that both U.S. evidence and European data point out that there is a strong positive correlation between feeling secure and saying one is satisfied with a job. In fact, the HOME variable of this study can be interpreted as an indication of job dissatisfaction. The estimation results are therefore not in line with the earlier UK empirical evidence.

The perception of job instability is negatively related to the presence of a part-time contract and positively related to the past overtime hours²⁸. In principle, the presence of

²⁷ Another possibility is that employees that have by nature a substantial risk of losing their jobs should hold more than just one current job. Bell *et al.* (1997) observe by using the British Household Panel Study that multiple job holding is an incomplete 'hedge' against financial insecurity in the UK. Keyssar (1986) provides an interesting discussion of unemployment in Massachusetts in the 19th century. According to Keyssar (1986) many people held many jobs as a mechanism of self-insurance.

²⁸ The results concerning the effect of a part-time job on insecurity is in conflict with the observations by Green *et al.* (2000) for the UK, according to which part-time jobs tend to yield an increase in the perception of job insecurity in low wage occupations.

earlier overtime hours could put more faith in the stability of the current match, because overtime hours are often implemented in the case of robust demand for the products and services of the particular firm, but the estimation results are not in line with this kind of reasoning. In contrast, the estimated impact of overtime hours on the perception of job instability is in line with the notion that hours of work are adjusted before the adjustment of number of employees as there is an increase in demand. Thus, the implementation of overtime hours reflects, in fact, the underlying uncertainty about the firms' current environment that is also reflected in the perception of job instability among employees. The results further indicate that the effect of a part-time contract on the perception of job instability disappears within the subpopulation of females (see Table 3b).

However, the most striking result of this study is that the perception of job instability is negatively related with the variable that captures the individuals that have a temporary contract²⁹. The estimation result also holds for the subpopulation of females (see Table 3b). The result can be interpreted as an indication of the feature in the European labour markets that persons who have started a temporary contact have already discounted the high subjective probability of job loss when they accept that type of contract. This means that a temporary contract as such does not yield an additional increase to the perception of job instability at the individual level of the economy. The above result is not in line with the observations by Green *et al.* (2001), according to which individuals holding short-term employment contracts are found to report the greatest levels of job insecurity in the UK. However, the result can be rationalized by noting that temporary contracts often provide a path towards more stable employment relationships³⁰.

The perception of job instability is not related at all to the fact that an individual is a manual worker, but negatively related to the feature that an individual has managerial duties in his/her current job. The latter can be rationalized by the notion that individuals that have managerial duties also have some power to decide about the separations of employees. In addition, the weekly hours of work are not related to the perception of job

²⁹ Temporary employment is defined as non-permanent employment (including fixed-term and temporary agency contracts).

³⁰ Houseman (1998) provides empirical evidence on this feature of labour markets for the U.S.

instability despite the fact that long hours of work by employees could serve as an indicator that the demand for firms' goods and services is relatively robust in the current market conditions. However, the perception of job instability is definitely more common in large cities with more than 100 000 inhabitants. This may reflect the stylized feature that large cities have pockets of high unemployment rates despite the fact that an increase in the density of economy activity can lead to more efficient matching within labour markets via the so-called thick market externalities.

The survey includes a limited number of variables that aim to characterize the firms' position in the economy. The results show that the perception of job instability is more common within manufacturing industries. This result is in line with the observations by Aaronson and Sullivan (1998) for the U.S., according to which job insecurity is substantially higher in the manufacturing sector than in all other major industries, but the breakdown of job insecurity by OECD (1997) is not able to find differences in the magnitude of the perception of job instability between industries and services in the context of European labour markets. However, the above result, according to which the perception of job instability is more common within manufacturing industries, is not in line with the stylized features presented in the recent literature on gross job and worker flows. This is due to the fact that the magnitude of gross job and worker flows tends to be higher in non-manufacturing industries compared with manufacturing industries (see, for example, Davis & Haltiwanger 1999).

In addition, the perception of job instability by individuals increases according to the size of the firm. The perception of job instability is therefore less common in small establishments. This result is not in line with the realized patterns of turnover, either, because the turnover of jobs and workers tends to decline as firms' size increases³¹. However, this observation can be rationalized by noting that there is almost always a low hierarchy in small firms compared with big companies with a great number of separate establishments, which facilitates a more efficient and detailed flow of information about firms' position in the population of small firms.

³¹ Davis and Haltiwanger (1999) provide a survey of the literature.

Finally, the country dummies that we included indicate that there are genuine differences in the perception of job instability from country to country in Europe after taking account of various factors that contribute to the incidence of job instability. For instance, the perception of job instability is lower in Denmark and higher in Spain than in Norway even after taking into account the controls included for the incidence of job instability at the individual level of the economy. This same pattern of job instability holds for the subpopulation of females (Table 3b). There are also unobservable idiosyncratic elements that affect the incidence of job instability in European labour markets. This feature is reflected in the pseudo R^2 of the estimated specifications.

4.1. The robustness of the reported results

Along with the reported estimation results in Tables 3a-3b, a version of Probit model was estimated that included the gender-specific unemployment rate by Eurostat (2000) for the European Union countries in 1998³². The unemployment variable was not statistically significant with the country dummies including the same control variables as the models reported in Tables 3a-3b. The reason for this feature is that there is no temporal variation in unemployment rates within countries at all, because the applied survey of this study provides cross-country information only for the single year 1998. This feature of estimation naturally extends to another variables by similar nature (including the variables that capture the institutional characteristics of European labour markets that were discussed at the end of the third section of the study). This means that there is no point to try to include institutional features as an additional explanatory variables to the reported Probit models of the study.

Without the country dummies, the results indicated that an increase in the gender-specific unemployment rate yields an increase in the perception of job instability among workers, which is, of course, deeply in line with common sense. The result is also in line with the Fig. 1. Another results remained the same as the reported ones in Tables 3a-3b. The same results as the ones with the gender-specific unemployment rate hold in the case that the unemployment rate was replaced by the gender-specific share of long-term unemployed of

³² The estimation results are available from the author upon request.

all unemployed individuals for the European Union countries excluding Luxembourg and Ireland provided by Eurostat (2000). The motivation for that particular specification was the fact that long-term unemployment definitely yields extremely high private costs to individuals in terms of lost human capital in the context of European labour markets.

Another points concerning the robustness of the reported results in Tables 3a–3b can be in a nutshell summarized as follows. As noted earlier, the size of company is a variable that is not available for all employees in the survey data. The exclusion of the size of company from the estimation of a Probit model with more extensive data (5435 observations) yields support to the notion that the highest educated employees (i.e. employees with a university/college degree) tends to have lower level of perception of job instability than the rest of the employees. The another results that were reported in Tables 3a–3b remain the same.

Without the country dummies, the results remained the same, but the GENOPTIMISTIC variable turned out to be statistically significant with negative sign as *a priori* expected. Thus, an increase in the optimistic perception about the aggregate economy delivers definitely a decline in the perception of job instability at the individual-level of the economy. In addition, the JOBS variable did get a negative sign. This means that there is some evidence for the view that an increase in the number of jobs is able to reduce the perception of job instability at the individual-level of the economy.

The exclusion of the PEROPTIMISTIC and GENOPTIMISTIC variables yielded the same results as the reported ones in Tables 3a–3b. In the case that the AGE2 variable was dropped, the AGE variable did get coefficient of 0.21 with z-statistics of 6.34 and the variable EXPERIENCE turned out to be statistically insignificant.

The survey includes a question about the employees' view about his/her labour market position from five years after the interview (the question 109a in the manual of interview, see Infratest Burke Sozialforschung, 1999a). The estimation results showed that the perception of job instability is highly correlated with the notion that an employee thinks that he/her is in the pool of unemployment individuals from five years after the interview. This fact is in line with thinking that workers are indeed able to deliver consistent answers to the questions about the perception of job instability at the individual-level of the economy.

5. CONCLUSIONS

The study explored the empirical determination of perceived job instability in Europe. The study was based on the large-scale survey from the year 1998 covering 15 member states of the European Union and Norway. The relationship between institutional features and the perception of job instability among workers is vague based on the evidence. However, the patterns of perceived job instability and the institutional features of European countries are not consistent with the popular notion that the perception of job instability declines as the strictness of labour standards and the strictness of employment protection increase in European labour markets. This pattern emerges despite the stylized feature of the earlier literature that the underlying magnitude of gross job and worker flows of the economies declines as the strictness of labour standards and employment protection increases. This means that the perception of job instability and the underlying gross flows of job and workers need not to be closely correlated.

The results show that perceived job instability increases with age. Educational level, on the other hand, does not correlate strongly with the perception of job instability. There are no differences in the perceptions of job instability between males and females. An occurrence of unemployment during the past five years delivers a substantial rise in the perception of job instability. The empirical finding that unemployment history strongly matters for the perception of job instability is consistent with the notion that an unemployment episode provides otherwise private information about unobservable productivity of an employee. The most striking result was that a temporary contract as such does not yield an additional increase to the perception of job instability at the individual level of the economy. However, the perception of job instability is more common within manufacturing industries. There are also strong country effects.

6. IMPLICATIONS

What are the most important economic consequences of the perception of job instability among employees? An immediate consequence of an increase in the perception of job instability is a substantial welfare loss to a worker, because for the large majority of employees only one match with an employer comprises most of the current earnings, making their welfare closely related to the potential risk of losing their job. As noted earlier, there are possible impacts on wage formation. Especially, Green *et al.* (2001) find that increased job insecurity, relative to aggregate unemployment rate, has recently contributed in part to wage restraint in the UK. Aaronson and Sullivan (1998) have indeed reported similar empirical results for the U.S. In addition, the perception of job instability among selected categories of workers can give rise to the so-called dual labour markets, which are characterized by the fact that only a part of total pool of all workers are at the adjustment margin of firms without affecting at all on the core of permanent employees, which are union and firm insiders. In fact, this pattern has realized in Spain during the 1990s (see, for example, Bentotila and Dolado, 1994), which is definitely characterized by the highest level of perception of job instability among employees in European labour markets as reported in Table 1. The perception of job instability has potentially another broad macroeconomic implications along with its impacts solely on labour markets. Especially, an increase in the perception of job instability among workers can yield an increase to precautionary saving behaviour, which has recently been one of the focuses of empirical studies on households³³.

³³ Carroll (2001) provides a survey of the literature.

Table 3A. The estimation results from the Probit model for the whole population of workers (dependent variable: WORRIED)

	Coefficients	z-statistics
AGE	-0.069	-2.025
AGE²	1.112	2.663
GENDER	-0.025	-0.461
DEGREE	-0.080	-1.224
MARRIED	-0.388	-0.747
PARTNER	-0.354	-0.683
CHILDREN	-0.007	-0.103
EXPERIENCE	-0.186	-2.412
TENURE	0.0796	1.275
UNEMPLOYED	0.270	4.454
GENOPTIMISTIC	-0.002	-0.018
PEROPTIMISTIC	-0.340	-3.923
JOBS	0.091	0.846
HOME	0.081	0.918
PART	-0.210	-2.403
OVERTIME	0.148	2.652
TEMPORARY	-0.473	-6.860
MANUAL	-0.045	-0.810
MANAGER	-0.111	-2.072
HOURS	-0.002	-0.726
METROPOLITAN	0.132	2.515
MANU	0.272	2.663
SERVICE	0.101	1.004
SIZE1	-0.300	-3.954
SIZE2	-0.269	-3.941
SIZE3	-0.207	-3.189
AUSTRIA	0.303	1.963
BELGIUM	0.244	1.519
DENMARK	-0.707	-4.295
FINLAND	-0.177	-1.067
FRANCE	0.204	1.528
GERMANY	0.496	3.739
GREECE	1.127	5.687
IRELAND	0.071	0.425
ITALY	0.682	4.735
LUXEMBOURG	0.050	0.267
NETHERLANDS	-0.045	-0.310
PORTUGAL	-0.323	-1.822
SPAIN	0.998	6.397
SWEDEN	-0.109	-0.695
UNITED KINGDOM	0.210	1.499

Constant	-3.574	-2.704
Pseudo R ²	0.122	
Log-likelihood	-1897.38	
Number of observations	3123	

Base case is a male, living in Norway, who is employed in agriculture.

Table 3B. The estimation results from the Probit model for the subpopulation of females (dependent variable: WORRIED)

	Coefficients	z-statistics
AGE	-0.052	-1.021
AGE ²	0.764	1.242
DEGREE	-0.141	-1.465
MARRIED	-0.828	-1.293
PARTNER	-0.655	-1.025
CHILDREN	0.068	0.724
EXPERIENCE	-0.095	-0.889
TENURE	0.070	0.743
UNEMPLOYED	0.166	1.930
GENOPTIMISTIC	-0.012	-0.064
PEROPTIMISTIC	-0.388	-2.821
JOBS	-0.100	-0.669
HOME	0.262	1.839
PART	-0.113	-0.979
OVERTIME	0.138	1.771
TEMPORARY	-0.505	-5.260
MANUAL	-0.131	-1.593
MANAGER	-0.070	-0.853
HOURS	0.002	0.466
METROPOLITAN	0.093	1.192
MANU	0.411	2.708
SERVICE	0.260	1.811
SIZE1	-0.208	-1.908
SIZE2	-0.302	-2.955
SIZE3	-0.298	-3.023
AUSTRIA	0.255	1.082
BELGIUM	0.299	1.249
DENMARK	-0.831	-3.197
FINLAND	-0.176	-0.741

FRANCE	0.159	0.771
GERMANY	0.393	1.933
GREECE	0.941	3.567
IRELAND	-0.317	-1.144
ITALY	0.720	3.203
LUXEMBOURG	0.195	0.706
NETHERLANDS	-0.197	-0.876
PORTUGAL	-0.566	-2.198
SPAIN	0.982	3.976
SWEDEN	-0.104	-0.397
UNITED KINGDOM	0.004	0.020
Constant	-1.944	-1.026
Pseudo R ²	0.131	
Log-likelihood	-889.51	
Number of observations	1484	

Base case is living in Norway and is employed in agriculture.

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Appendix A. The number of interviews across countries

Country	Number of interviews
Austria	1501
Belgium	1510
Denmark	1485
Finland	1504
France	3026
Germany	2998
Greece	1506
Ireland	1400
Italy	2992
Luxembourg	822
Netherlands	1500
Norway	1500
Portugal	1501
Spain	3000
Sweden	1312
United Kingdom	3000

Appendix B. Selected descriptive statistics for the whole population of employees

Variable	MEAN	STD	MIN	MAX
WORRIED	0.277	0.448	0	1
AGE	38.432	10.936	16	64
GENDER	0.517	0.500	0	1
DEGREE	0.292	0.455	0	1
MARRIED	0.655	0.476	0	1
PARTNER	0.341	0.474	0	1
CHILDREN	0.617	0.486	0	1
EXPERIENCE	0.719	0.449	0	1
TENURE	0.412	0.492	0	1
UNEMPLOYED	0.198	0.398	0	1
GENOPTIMISTIC	0.090	0.300	0	1
PEROPTIMISTIC	0.110	0.313	0	1
JOBS	0.932	0.252	0	1
HOME	0.100	0.300	0	1
PART	0.193	0.395	0	1
OVERTIME	0.641	0.480	0	1
TEMPORARY	0.831	0.375	0	1
MANUAL	0.362	0.481	0	1
MANAGER	0.378	0.485	0	1
HOURS	39.037	12.064	1	88
METROPOLITAN	0.430	0.495	0	1
MANU	0.244	0.429	0	1
SERVICE	0.716	0.451	0	1