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Thomas Barnay (Upec, Erudite, Tepp)

- Abstract -

Economists have traditionally been very cautious when studying the interaction between employment and health because of the two-way causal relationship between these two variables: health status influences the probability of being employed and, at the same time, working affects the health status. Because these two variables are determined simultaneously, researchers control endogeneity skews (*e.g.*, reverse causality, omitted variables) when conducting empirical analysis. With these caveats in mind, the literature finds that a favourable work environment and high job security lead to better health conditions. Being employed with appropriate working conditions plays a protective role on physical health and psychiatric disorders. By contrast, non-employment and retirement are generally worse for mental health than employment, and overemployment has a negative effect on health. These findings stress the importance of employment and of adequate working conditions for the health of workers. In this context, it is a concern that a significant proportion of European workers (29%) would like to work fewer hours because unwanted long hours are likely to signal a poor level of job satisfaction and inadequate working conditions, with detrimental effects on health. Thus, in Europe, labour-market policy has increasingly paid attention to job sustainability and job satisfaction. The literature clearly invites employers to take better account of the worker preferences when setting the number of hours worked. Overall, a specific “flexicurity” (combination of high employment protection, job satisfaction and active labour-market policies) is likely to have a positive effect on health.

JEL Codes: I18, I28, J28, J81

Key words: work, health, working conditions, employment, causality

Health, Work and Working Conditions: A Review of the European Economic Literature¹

Thomas Barnay (Upec, Erudite; Tepp)²

1. Introduction

The interactions between health, work and working conditions have attracted considerable interest recently in Europe. A large part of European employees (EU27) - about 80% - benefit from ‘permanent contracts’ which are stable and offer guarantees in terms of job security (EWCS 2010)³. Nevertheless, even these workers are being put under rising pressures by deep changes in labour-market trends. Job strain may have a large impact on health, and in return a deteriorated health status undermines employability. European workers experience a degradation of the quality of working life between 1995 and 2005 (Greenan *et al.*, 2013). Almost one third of EU citizens report that work affects their health (EWCS 2010). When asked how work influences their health, 25% of Europeans declared work to be pathogenic. Conversely, only 7% reported work to be positive to their health. The average weekly working time has decreased from 40.5 hours in 1991 to 37.5 hours in 2010 due to the rising share of part-time jobs (38% for women and 13% for men) and the declining share of people working very long hours (48 hours or more per week). Yet, more European workers say they would like to work fewer hours (31%) than workers who say they would like to work more hours (16%), suggesting a high level of dissatisfaction with working conditions (Eurofound, 2012). Moreover, European workers tend to be concerned about their exposure to risks of work-related injuries resulting from painful positions (reported by 46% of the European working population) as well as repetitive movements (63%). The growing use of information and communication technologies and specifically computers (used frequently throughout the day by one third of the European workforce) contributes to this trend⁴.

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³ The European Working Conditions Survey (EWCS) is an important source of information about working conditions, work quality and employment. The fifth ECWS concerns EU27, Norway, Croatia, the former Yugoslav Republic of Macedonia, Turkey, Albania, Montenegro and Kosovo.

⁴ In France, new work practices (*e.g.* quality norms, job rotation, flexibility of work schedules) are correlated with bad mental health and a detrimental work environment (Askénazy and Caroli, 2010).

The interaction between health and employment is the subject of numerous research studies and can be understood as a two-way causal relationship: employment has an impact on health and health has an impact on employment (“*healthy worker effect*”) (Currie and Madrian, 1999; Lindeboom, 2006). Indeed, in a labour-market model, health status may be endogenous both in a structural sense (e.g., health and labour market outcomes are determined simultaneously) and in a statistical sense (e.g., unobserved heterogeneity). This study reviews, in European countries, empirical papers dealing with this two-way causal relationship.

The economic literature on the relationships between employment and health is sparse, compared to the vast number of studies published in other fields such as epidemiology, sociology and psychology. Economists have long been very cautious on this issue because causal mechanisms are difficult to identify and subjective variables are difficult to study⁵.

More research on these issues would be important because inadequate working conditions and poor job satisfaction negatively affect health, with costly consequences both for individuals and for society at large. At a broad level, the social costs of mental health have been estimated to be as high as 3 % to 4 % of GDP in the European Union (International Labour Organization). Sobocki *et al.* (2006) estimate that the total cost of psychological depression in Europe was €118 billion in 2004 (e.g. about €253 *per capita*). In some high-income countries, 40% of disability can be linked to mental disorders (WHO, 2010).

Furthermore, faced with unsustainable pension systems, European governments have raised retirement ages and/or increased the contribution period required to access full pension rights. However, despite the objective set at the Stockholm European Council to achieve an employment rate of 50% for those aged 55-64 years old by 2010, the European average was still only 47.4% in 2011. Hard working conditions and health capital degradation contribute to lower productivity among older workers, increasing their take-up of sick leave and raising the risk of job loss (Blanchet and Debrand, 2005).

A better knowledge of the complex interactions between work and health is necessary to promote the prevention of occupational health risk, through the quest for new forms of organization that are less harmful for health. This should be a key priority of labour-market and health policies.

⁵ As pointed out by Freeman (1978), “*subjective variables like job satisfaction (...) contain useful information for predicting and understanding behavior*” but “*they also lead to complexities due to their dependency on psychological states*” (about this second point, see section 2).

The paper is organized as follows. Section 2 deals with methodological issues around employment and health measurements. Section 3 describes the main results relative to the effect of employment on health. Section 4 presents the European literature relative to the *healthy worker effect*. In a final section, we discuss policy issues related to health at work.

2. The measurement frame of health, work and employment relations

Various sources of bias may affect the assessment of health, work and employment relations, such as reporting biases related to the collection mode of information, skews in health and work measurements and justification biases.

2.1 Health measurement

Reporting biases

Biases are inherent in all surveys of self-reported subjective variables. Self-assessments, which are included in most health national surveys, are affected by social characteristics and individual health status, which can result in sociocultural and endogenous biases (Bound, 1991). Moreover, the comparability of results aggregated by categories such as social group, gender and age can be compromised by the existence of different norms and expectations, thus resulting in measurement errors (Akashi-Ronquest *et al.*, 2011; Etilé and Milcent, 2006; Shmueli, 2003). Using the SHARE⁶ survey, Jürges (2007) explores Self-Assessed Health (SAH)⁷ across European countries. They run an Oaxaca-Blinder decomposition of SAH to distinguish “true” health (captured by chronic diseases and objective health data such as grip strength, walking speed and Body Mass Index) and cross-cultural differences in reporting styles. They show that most of the differences between European citizens in better health (Denmark, Sweden) and those in worse health (Spain, Italy) is attributed to differences in reporting styles. To avoid these self-related biases, authors combine subjective measures of health status with objective measures, in particular indicators that pertain to the relation between health and employment. Based on SHARE data, Kalwij and Vermeulen (2008) confirm that the introduction of objective measures is required to control SAH endogeneity when assessing the impact of health on employment⁸. The most natural objective indicator is disability (see subsection 4.1), often assessed in surveys in

⁶ Share: Survey of Health, Ageing and Retirement in Europe. This longitudinal survey contains accurate data on health, employment and working conditions of a representative sample of individuals aged 50 and over in 11 European countries. This survey is equivalent of The Health and Retirement Study (HRS) in the USA.

⁷ SAH is measured on a five point scale asking the question “*How is your health in general; would you say it is...*”. SHARE contains two different 5-point scales for SAH, one ranging from ‘excellent’ to ‘poor’, the other from ‘very good’ to ‘very poor’.

⁸ Moreover, SAH stay a good proxy of health status because it is highly correlated with objective measures such as mortality (Idler and Benyamini, 1997)

terms of activity limitations⁹. Nevertheless, disability is only one aspect of health status and other health indicators must be used to take into account the multidimensional nature of health (Loprest *et al.*, 1995).

Justification bias

Many articles in the literature deal with the potential existence of a “justification assumption” according to which self-reported health (or disability) would depend on people’s labour-market situation. More precisely, people would tend to justify their labour force non-participation by over reporting a handicap (most frequently defined as a long-term health event that limits the type and quantity of work that people can perform). A series of studies tackles the issue of endogeneity between self-reported disability measures and labour force participation (Dwyer and Mitchell, 1999; Lindeboom and Kerkhofs, 2009; Benitez-Silva *et al.*, 2004; Cai, 2009; Gannon, 2009; Akashi-Ronquest *et al.*, 2011). Although some studies, such as that of Lindeboom and Kerkhofs (2009) and Gannon (2009) show, respectively on Dutch and Irish panel data, that the economic incentives related to labour-market status encourage people to misreport their disability status (even when controlling for unobserved heterogeneity as in Gannon, 2009), other studies conclude the opposite result¹⁰.

2.2 The Measurement of Work and Employment Relations

Work is easier to measure than health. In microeconomic studies of labour supply, we traditionally distinguish two definitions of work: an intensive margin (working hours) and an extensive margin (employment status). In an intensive margin approach, a great deal of definitions has been studied in the epidemiological literature.

The measurement of work relations

Working conditions have been defined in seminal sociological and psychological papers. In particular, the Job Demand-Control (JD-C) Model, *e.g.* the imbalance model between perceived pressure (demand) and decision latitude (level of control), refers to concepts of *job decision latitude*, *job demand* and *job strains* (Karasek, 1979; Karasek and Theorell, 1991). In its basic form, the JD-C Model postulates that the primary sources of job stress lie within both job’s basic characteristics: *psychological job demands* (high pressure of time, high working pace, difficult and mentally-demanding work) and *job decision latitude* (worker's ability to control his own activities and skill

⁹ A very widespread question to measure activity limitation is “*For the past six months at least, to what extent have you been limited because of a health problem in activities people usually do?*” This question corresponds to the Global Activity Limitation Indicator (GALI) which is standardized, at European level, through The Minimum European Health Module.

¹⁰ This is notably the case of Cai (2009) on Australian data.

usage) or *job control*. Strong job demand combined with low job control leads to a high-strain jobs. This situation called “*job strain*” is associated with a higher propensity to cardiovascular disease, as well as in mental health problems (Kivimaki *et al.*, 2006; Bonde, 2008). *Job strain* potentially concerns a high number of EU workers as about 60% report having a highly-demanding job and more than a third reports low autonomy in their job (EWCS 2010). The situation becomes even more detrimental in the case of *social isolation* (*i.e.* lack of social support at work from the hierarchy and/or colleagues). An “*iso-strain*” situation is detected in the case of *job strain* combined with a lack of social support and leads to deteriorating physical health, notably cardiovascular diseases (Lindblom, 2006).

Siegrist’s model (1996) introduces Effort-Reward-Imbalance (ERI). Rewards are provided to employees by three potential channels: money (*i.e.*, adequate salary), esteem (*e.g.* respect and support) and security/career opportunities (*e.g.* promotion prospects, job and employment status securities). Siegrist shows that high effort–low reward leads to increased cardiovascular risk and psychiatric disorders. Even if the scope is broader, the ERI model appears close to the prediction of the theory of compensating wages differentials. Workers with the same productivity should receive different wages if they perform tasks of different levels of difficulty in a pure and perfect competition model. This is the Hedonic Price Wage theory, proposed by Rosen in 1974, which reflects the size of the heterogeneity of wages.

The measurement of employment relations

More recently, other concepts have emerged concerning psychosocial factors at work. From an economic standpoint, four dimensions were especially stressed: duration of working time (van der Hulst, 2003), extended working time (van der Hulst, *op.cit.*), job insecurity (Sverke *et al.*, 2006) and job satisfaction.

A majority of European workers (55%) are satisfied with working the same number of hours as they currently do. However, a significant proportion would like to work fewer (31%) or more (14%) hours (EWCS 2010). There are important differences concerning the responses when controlled for age, gender, employment status and current working hours. The main factors increasing the willingness to work more hours are: being a man, being young and already working long hours. People willing to decrease their working hours are mainly: working atypical hours, working in a high-intensity job and those in the lowest-income bands. Working part time may have a positive impact on one’s life as it is associated with achieving a better balance between working life and private life, as well as having a better health status. Those who work part time are less likely to say they have good career prospects, but those working long hours face work–

life conflicts. The same can be said for people working atypical hours (night work and 'on call' workers representing around 20% of the European working population) (EWCS 2010).

The fear felt by a worker of losing his job relates to the job-insecurity concept. In Europe, overall, job security prevails as about 90% of public, health and education sector workers are expecting to keep their job for the next 6 months, but this figure is much lower for industry and construction workers (*resp.* 79% and 78%) (EWCS 2010).

In sum, the various aspects of working conditions could be embodied by the concept of job satisfaction which refers to employment relations. Job satisfaction is often used as an overall summary of feelings about how workers consider their job. This concept is particularly important as the feelings of work-related satisfaction or dissatisfaction contribute to overall quality of life (Drobnič *et al.*, 2010). Timming (2010) showed that being supported by the hierarchy, being safe in the job, having a good balance between life and work, satisfaction with pay (Siegrist, *op.cit.*) and having opportunities to “*learn and grow*” were significant factors of high job satisfaction in most European countries. Another study from Sousa-Poza *et al.* (2000), on the basis of International Social Survey Program (ISSP), added the importance of having an interesting job. A specific part of the literature also focused on the importance of a good match between workers' skills and duties (a mismatch potentially leading to dissatisfaction and reduced well-being; Green, 2011).

Bassanini and Caroli (2014), in economic review, show that the effect of work on health changes according to individual preferences. Unwanted long hours and an obligation to stay in employment affect an individual's health status. This is very similar to a work-leisure trade-off in a neoclassical model of labour supply (Allen, 1981) in the case of intensive margin. Within this framework, the negative impact of work on health could correspond to the differential between the contractual number of hours and the desired number of hours.

3. Effect of employment on health status

Employment affects health *via* a variety of potential channels, such as risk behaviours, healthcare access, material life or early-life conditions and cumulative effects. Risk behaviours (tobacco, alcohol or drug consumption, sedentariness, etc.) are determining factors in the early occurrence of chronic disease. These behaviours are more widespread in disadvantaged environments (Stronks *et al.*, 1997, in the Netherlands). Marmot (2000) shows that a third of the variance in mortality rates due to coronary disease can be attributed to tobacco consumption, high blood pressure or sedentariness. Access to healthcare could equally play a role in the causal relationship between employment and health status. In France, the Statutory Health Insurance scheme covers

the quasi totality of the population; only 6% remain without complementary health insurance (CHI) coverage. Among individuals without CHI coverage, 46% self-report financial reasons. Furthermore, coverage levels among the CHI beneficiaries are extremely heterogeneous. The more generous company-provided CHI reinforces the social health inequalities between the employed and the non-employed populations and also within the working population: 76% of executives benefit from employer-provided CHI against only 58% of unskilled workers and 53% of trade sector employees (Perronnin *et al.*, 2011). Favourable socioeconomic conditions result in access to better healthcare quality through access to better information and a higher degree of preventative behaviour. Furthermore, better professional integration improves the income level and thereby increases the opportunities to invest in one's health through sport, healthy diet, better housing conditions and even better working conditions. By improving one's material living conditions, the improved socioeconomic status leads to a better health status. The literature has shown that an improvement in living conditions is conducive to a better health status, whether it is defined in terms of income (Ecob and Davey Smith, 1999 in England, Wales and Scotland ; Fiscella and Franks, 2000 in 21 countries and territories), employment status (Mesrine, 2000 in France), working conditions, education level (van Rossum *et al.*, 2000 in the Netherlands), socio-demographic factors (Grundy and Holt, 2000 in Great Britain) or living environment and neighbourhood (Bosma *et al.*, 2001 in the Netherlands). In following subsections, we focus on the health effect of working conditions (3.1) - in a large sense - and unemployment/retirement (3.2). In subsection 3.3., we describe the effect of working conditions on the specific topic of mental health.

3.1 Effect of Work and employment relations on physical health

The interactions between work and employment relations and workers' health conditions have received considerable attention in epidemiology and health economics fields. Psychosocial factors, such as the feeling of hierarchical dominance or the loss of autonomy or deprivation, increase the probability of exposure to stress and psychological distress. An individual's socio-professional situation will thus favor (or not) the emergence of psychosocial problems that will lead to deterioration in health status.

Llena-Nozal (2009) and Datta Gupta and Kristensens (2008) show, with longitudinal data and cross-country comparisons, that a favorable work environment and high job security lead to better health conditions, after controlling for unobserved heterogeneity.

The physical health of workers who have part-time jobs is worse than those who are full-time (Gash *et al.*, 2007 in West Germany and Spain; Waenerlund *et al.*, 2011 in Sweden; Robone *et al.*,

2011 in UK; Carrieri *et al.*, 2012 in Italy). For instance, on 12 waves of the BHPS¹¹, Robone *et al.* (*op.cit.*) estimate current SAH and a reduced version of the GHQ¹² by a dynamic panel ordered probit specification with correlated random effects, controlling for prior health status. Having a part-time job (as compared to full-time job) has an asymmetric impact on health for both men and women according to preferences for the number of work hours. Their results suggest that the impact of part-time work is positive only among upper social classes. Reversely, individuals with unsecure contractual conditions experience bad health if their jobs are associated with low levels of employability.

In order to identify the specific effect of the employment contract on health, it is necessary to control for observed and unobserved heterogeneities because the choice of job allocation is unlikely a random experience (due to heterogeneity of individual preferences, risk aversion attitudes, working conditions and health status among population). It is known that contract workers can be characterized by poorer physical and psychological working conditions (Burchell, 1994). Taking into account unobserved heterogeneity and selection effects (*e.g.* self-selection of workers with a lower health status into temporary employment) in panel data, studies find significantly reduced (indeed no) effects of the contract on the physical and mental health (Cottini and Lucifora, 2013 ; Ehlert and Schaffner, 2011.).

Cottini and Lucifora (*op.cit.*) use EWCS data (waves 1995, 2000, 2005) and study 15 EU countries. They investigate the role of working conditions on mental health. They implement IV strategy relying on variation across countries in terms of workplace health and safety regulation in order to identify the causal effect of bad working conditions on mental health. They find that job quality (in particular job demands) affect mental health. Based on the EU-SILC data (2004-2008)¹³, Ehlert and Schaffner (*op.cit.*) use a fixed-effects ordered logit model to measure the impact of a work contract on SAH. They propose two ways in order to control for selection effects. In a first specification, they restrict the sample to young labour market entrants (below 30) who join the labour market after education. In a second specification, in order to control for negative health effects following temporary employment, they restrict the analysis to those with temporary contracts who changed their job due to the end of a contract. They find no health differences between labour market entrants according to contract (temporary or permanent

¹¹ British Household Panel Survey.

¹² General Household Questionnaire.

¹³ The European Union Statistics on Income and Living Conditions (EU-SILC) allows to collect timely and comparable cross-sectional and longitudinal multidimensional microdata on income, poverty, social exclusion and living conditions. EU-SILC is organised under a framework regulation and is thus compulsory for all EU Member States. The EU-SILC data cover all EU countries except Malta.

employment). However, they observe a negative effect of additional temporary employment on SAH (in reference to a full employment contract).

The average working time in the EU27 was 37.5 hours a week (EWCS 2010). About 25% of European workers were part time workers while 13% were concerned by working long hours. Is this population prone to a greater risk of health capital deterioration? Robone *et al.* (*op.cit.*) show that a preference for less working hours causes bad SAH among both the men and women population (the reverse is also true, but only for men who want to work longer). Combining a part-time job and preferences for less working hours is associated to bad SAH for women. However, long working hours increase psychiatric disorders (Cottini *et al.*, *op.cit.*)¹⁴. Bell *et al.* (2012) analyze the effect that hours constraints (difference between actual working hours and desired working hours) have on different measures of workers' health (SAH and health satisfaction) in Germany (G-SOEP¹⁵) and the UK (BHPS) by using fixed-effects ordered logit models. For both countries, overemployment causes negative effects on both health measures.

3.2 Job loss and physical health

Job loss is associated with bad individual well-being (Clark *et al.*, 2008). *A priori*, the persistence of massive unemployment and recurrent forms of non-employment has a deteriorating effect on health status¹⁶. Numerous European studies focus on the relationship between unemployment and poor health (Kalwij and Vermeulen, 2008 in Europe; Böckerman and Ilmakunnas, 2009 in Finland; Eliason and Storrie, 2009 in Sweden; Haan et Myck, 2009 in Germany) and on the effects of retirement on health (In Europe : Coe and Zamarro, 2011 and for international comparison, see Rohwedder and Willis, 2010). Once again, this relationship is subject to endogeneity; lower health in the unemployed than in the employed could be explained by *reverse causality*.

To check this assumption, using the European Community Household Panel (ECHP)¹⁷ for Finland over the period of 1996–2001, Böckerman and Ilmakunnas (2009) implement Chamberlain's random effect estimation in an ordered probit model to measure the impact of unemployment on health. Using G-SOEP data, Schmitz (2011) estimates, for Germany, a fixed

¹⁴ See table 2 on p.968 (before IV implementation). After endogeneity control, table 5 don't show detailed results of job demands. Overall findings therefore lead to validate negative role of job demand on mental health.

¹⁵ The German Socio-Economic Panel (G-SOEP) is a longitudinal survey of approximately 11,000 private households from 1984 to 2012 (in the Federal Republic of Germany), and from 1990 to 2012 (in eastern German Länder).

¹⁶ To review the effect of job loss on overweight and drinking see Partha *et al.*, 2011.

¹⁷ ECHP (European Community Household Panel) is built from Annual interviews of a representative panel of households and individuals in each European Union (EU) country.

effect model. He finds no significant health effect (measuring by health satisfaction, hospital visits and mental health score). Their results demonstrate that unemployment does not appear to have a significant negative effect on SAH¹⁸.

To tackle the problem of endogeneity, studies focus on job loss due to plant closure. Using administrative data panel in Denmark in the period 1980–2006, Browning and Heinesen (2012) estimate the causal effects of job displacement due to plant closure on mortality and hospitalization outcomes among the male workers population in the private sector by using propensity score weighting. They find that job loss increases the overall mortality risk and especially circulatory disease, suicide mortality, death and hospitalization due to traffic accidents, alcohol-related disease and psychiatric disorders. These results converge with Kuhn *et al.* (2009) using Austrian data, which find a positive effect of job loss due to plant closure on public health expenditures generated by additional psychotropic drugs consumption and hospitalization cost due to mental problems and stroke among male population (matching procedure with propensity score). From NPSLC¹⁹ (1997-2002) and the 2003 EU-SILC, Osthus (2012) estimates a dynamic probit model (with unobserved heterogeneity) on Norwegian data. The author plays down the results of previous studies because they only measure a transitory negative effect on mental health and show no effect on physical health.

The nature of the causal relationship between retirement and health is not obvious and can be bidirectional due to retirement endogeneity. Retirement may first free individuals from a job strain situation and may improve, in particular, short-term mental health. This positive dynamic will be sustainable as long as individuals have a capacity to invest in their health (*via* an income effect) (Grossman, 1972²⁰). Conversely, a retirement shock can also cause a loss of a social role (Kim and Moen, 2002, USA), a decline in human capital stock and therefore a deterioration of health will be enhanced by a negative shock on living standards of the retiree. Bad health status results in early retirement from the labour market (Bound *et al.*, 1999; Dwyer and Mitchell, 1999; Kerkhofs *et al.*, 1999; in France: Barnay 2010; Barnay and Briard, 2011). Thus, retirement can be desired by unhealthy, old European workers. Using SHARE data (2004 wave), Blanchet and Debrand (2005) conduct an endogenous selection model by controlling for monetary factors and in particular, the structure of pension entitlements. They show that bad health and job dissatisfaction are significant determinants in the desire to retire as early as possible. From the

¹⁸ These results corroborate Browning *et al.*, 2006, for Denmark.

¹⁹ Norwegian Panel Survey of Living Conditions

²⁰ Galama *et al.* (2012) extended the structural model of Grossman with endogenous retirement age

same European data, Coe and Zamarro (2011) measure the effect of retirement on health (by using country-specific early and full retirement ages as instruments). They conclude that retirement decreases the probability of reporting bad health (35 percent), after controlling for endogeneity (reverse causality). Nevertheless, this effect is not observed with both measures of depression²¹. In the UK, Bound and Waidmann (2007) examine both SAH and objective health measures effects of retirement using one wave of the ELSA²². They find a positive but transitory health effect in retirement only for men. In France, using the *Barometre Santé* dataset (1993 and 2005) and both econometric strategies (difference-in-differences and IV method), Garrouste and Blake (2012) study the impact of retirement on different Duke scores²³. They show that retirement has a positive impact on physical health (difficulty walking up a flight of stairs) for low-educated individuals.

3.3. Impact of employment and working conditions on mental health

Methodological difficulties in measuring health seem even more pronounced in relation to mental health. Devaux *et al.* (2008) attempted to assess the reporting bias linked to mental health. They conclude that a latent health status strongly contributes to mental health: two people may declare different mental health levels according to their physical health. Indeed, a person with poor physical health is more likely to report poor mental health. The role of latent health status in the declaration of mental disorders seems to be confirmed, especially by Leach *et al.* (2008), on the basis of Australia data, which show a strong correlation between physical and mental health, and particularly in the female population. This gender effect is confirmed by Barnay and Defebvre (2014) in a French study. From an IV approach using the Health and Professional Itinerary Survey (*Santé et Itinéraire Professionnel, SIP*), they show that poor mental health in the male population decreases the probability of staying in employment after including physical health as control variables. In the female population, physical health is predominant on their professional trajectory and there is no specific effect of mental health on employment.

In addition, omitted variables generate unobserved individual heterogeneity, which is also a potentially endogenous factor. Risk preferences (Zhang *et al.*, 2009), job involvement and satisfaction (Nelson *et al.*, 2008), family background (Banerjee *et al.*, 2013) and risk behaviours (smoking, alcohol and overweight) are all related to both mental health and employment.

²¹ They use two depressions measures: Euro-D depression scale and a simple indicator variable relative to sadness or depression during the last month.

²² ELSA : English Longitudinal Study of Aging

²³ The Duke Health Profile (DUKE) is a 17-item generic self-report instrument containing six health measures (physical, mental, social, general, perceived health, and self-esteem), and four dysfunction measures (anxiety, depression, pain, and disability)

We examine three categories of determinants: employment, working conditions and long-term effects of initial conditions.

Overall, being employed plays a protective role on psychiatric disorders. In the Netherlands Plaisier *et al.* (2008) use cross sectional data to measure various social roles (employee, partner and parent) with the prevalence of anxiety and depressive disorders²⁴ (without correcting for endogeneity). Both having a job and working full time were associated with a lower prevalence of anxiety disorders and depression among men, but not among women. The effect of employment is confirmed in a robust econometric study of the UK based on a fixed-effect dynamic panel data model for mental health²⁵ (Llena-Nozal *et al.*, 2004). Gender differences are corroborated. Employment status is a determining factor for males but not for females. The effect of retirement on health status seems significant when considering mental health indicator. On the basis of SHARE data, and using Instrumental Variables (IV) strategies, Mazzonna and Peracchi (2012) find a negative impact of retirement on mental health²⁶ after properly controlling for several identifications issues (retirement endogeneity, cohorts and retirement effects heterogeneity in particular). This mental retirement effect can be attributed to a decrease in human capital investment and an “unengaged lifestyle hypothesis” (Rohwedder and Willis, 2010). Non-employed men have substantially worse mental health. From the 1994 Catalanian Health Survey, Artazcoz *et al.* (2004), without endogeneity control, the authors show that non-employment is associated with problems of mental health for men, and to a lesser extent for women in Spain. If being in employment appears as a tool of good mental health’s promotion, especially among men, the working conditions can be potentially pathogenic and provoke mental health problems.

Using longitudinal surveys for the UK (BHPS, 1991-2005), Switzerland (SHP²⁷, 1999-2005), Australia and Canada, Llena-Nozal (2009) estimate, by performing a fixed-effect panel model, the impact of changes of hours worked on an indicator of mental distress. Non employment is generally worse for mental health than employment.

In France, among men and women, constrained part-time work is associated with a higher depression. From the 2003 Decennial Health Survey, Santin *et al.* (2009) show that having a fixed-term contract is correlated with depression, but only for women. Workers on temporary

²⁴ Psychiatric disorders are measured using a computerized version of the Composite International Diagnostic Interview.

²⁵ Mental health is assessed through the Malaise Inventory designed by the Institute of Psychiatry from the Cornell Medical Index

²⁶ The cognitive ability is defined from tests of orientation in time, memory, verbal fluency and numeracy

²⁷ Swiss Household Panel

contracts may suffer more psychological costs and stress due to exposure to job insecurity (Ferrie, 2001; Ferrie *et al.*, 2005; Chenga Yawen *et al.*, 2005; Green, 2011; Caroli and Godard, 2013). Thus, Bildt *et al.* (2002) show that exposure to difficult working conditions may have an adverse effect on mental health, with differences according to gender. Men are more affected by changes in tasks and a lack of pride at work. Among women, other drivers explain this effect, such as no training, low motivation and weak social support at work. Men suffer from the omnipresence of work in their lives and the repetitiveness and lack of cooperation in the labour force. Women, in addition to the repetitive nature of tasks and lack of cooperation, identify starting work before age 18 and involuntary interruptions during work as criteria impacting their health. Using Karasek (1979) and Johnson *et al.* (1989) models, Laaksonen *et al.* (2006) show that stress at work, job demand, weak job decision, lack of justice and support induce bad health.

Significant life events also play a role in determining the current state of mental health. Unemployment and non-employment, during the beginning of working life can induce depressive symptoms later. Workers who have higher risk of long-term unemployment suffer from feelings of job insecurity and face a higher risk of mental health than others (OECD, 2013). It has been shown that events such as illness or the death of a close relative or partner, marital separations, and serious quarrels also tend to impact mental health (Lindeboom *et al.*, 2002 in the Netherlands, Dalgard *et al.*, 2006 in five European countries). Past or present financial difficulties are also often associated with the onset of common mental disorders, such as depression and anxiety (Weich *et al.*, 1998). Finally, a degradation in physical condition induced impairment of mental health, especially for women (Leach *et al.*, 2008). Bad health or the presence of disability in childhood has negative consequences on mental health at older ages, as well as chronic diseases, regardless of the age of onset (Llena -Nozal *et al.*, 2004).

4. The healthy worker effect

The *healthy worker effect* refers to the selection of workers in good health and reflects past personal experience having undermined health and professional paths. For instance, several studies attach importance to the cumulative effects of events experienced throughout an individual's life cycle having reinforced the selection effect. An individual's socioeconomic situation during childhood, or even *in utero* (according to the *latency hypothesis* or *latency model*, Barker, 1995; Wadsworth, 1999), and labour market trajectory described as the *pathway model* (Case *et al.*, 2005) are important determinants of health status in adulthood. Lindeboom *et al.* (2006) show that the childhood environment influences the probability of experiencing occupational accidents and disabilities. A

large body of literature equally acknowledges the role played by the social determinants of health (Marmot and Wilkinson, 1999; Berkman and Kawachi, 2000).

Moreover, we can observe a self-selection of workers with a lower health status into, for instance, temporary employment or specific jobs. Tackling this selection problem can lead to invalidate the negative effect of temporary contracts on health status (Cottini and Lucifora, 2013; Ehlert and Schaffner, 2011).

Selection effects must be taken into account to measure the net effect of work on health. Several empirical strategies are used to correct the different sources of bias described above. This is very difficult in cross-sectional approaches; researchers use instrumental variables (IV) and bivariate probit methods, but they face problems of weak instruments²⁸. The best strategy relies on panel data which enables control for unobserved time-invariant individual and temporal heterogeneities.

4.1 Effects of disabilities on work²⁹

In this main field, we select two topics: the effectiveness of legislative and fiscal measures relative to handicaps and the impact of handicaps on professional paths.

A first category of studies deals with the effects of disability insurance benefits programmes (in terms of eligibility criteria and generosity), notably provisions seeking to maintain disabled persons in employment (Staubli, 2011; Marie and Vall Castello, 2012). Vall-Castello (2012) evaluated the effects of a policy promoting employment among disabled women in Spain. The author studies the impact of reducing social security contributions for employers who hired disabled women. The study uses a difference-in-differences method with a recursive bivariate probit model to evaluate the existence of changes in trends for the employment of females in relation to that of males due to the policy, conditional on any pre-existing trends. It shows a significant effect from the reductions of the Social Security employer contributions and estimates an average elasticity of employment with respect to these reductions of 0.08 for women with long-term disabilities. Other studies have also used the difference-in-differences method to examine the influence of the disability insurance programs on individuals' professional careers. Along the same lines, Staubli (2011) studies, in the case of Austria, the effect of linking the eligibility to disability insurance to return to work and disability enrolment. They identify a

²⁸ Indeed with *IV method*, the "*cure can be worse than the disease*" (Bound, Jaeger and Baker, 1993)

²⁹ The first part of this sub-section was partially co-written with E. Duguet, C. Le Clainche, M. Narcy and Y. Videau in a work in progress called "The Impact of Disabilities on Occupations: A Comparison Between Public and Private Sectors".

statistically significant positive effect for this type of measure on labour market participation (in the private sector) for disabled men aged 55 and over (an increase of 1.6 to 3.4 points). The method is based on a study of differences over time and according to a gender-age mix. Marie and Vall Castello (2012) look into the impact of establishing a more generous disability insurance programme on the rate of labour market participation for claimants suffering from partial disability (who can combine disability benefits and job income) for individuals aged 55 and over (the only ones eligible for such benefit increases). Using Spanish data, the authors find that a 36% increase in the amount of disability pensions reduces the probability of being employed by 8%.

A second category of studies has to do with the impact of disability on labour-market outcomes, including professional careers. Jones (2011) estimates the influence of different characteristics of disability (type, origin, duration, severity) on the probability of being employed and on labour-market earnings, using an *ad hoc* module of the 2002 UK Labour Force Survey. The study only includes people reporting disabilities and estimates are made separately for men and women. Selection effects due to only considering employees experiencing disabilities are taken into account. The results reveal a positive influence of disability at birth on employment, but only for men, as well as a positive influence of disability resulting from a traffic accident for both men and women. On the other hand, mental illness negatively affects employment both for men and women. Disability's form has far less influence on earnings than it has on employment.

Furthermore, two other articles are based on a rather similar methodology, using matching methods with temporal lag between the occurrence of the health shock leading to disability and the evaluation of outcomes in terms of vocational integration. Lechner and Vazquez-Alvarez (2011) estimate the effect of becoming disabled (officially recognized) on labour market outcomes: employment, unemployment, exiting the labour market, net annual earnings and per capita household disposable income, and average weekly hours worked. They use German panel data from 1984 to 2002 that they cut into sequences of four successive years and implement propensity score matching. The individuals belonging to the control group, the so-called "untreated", are individuals not officially recognised as disabled over the four-year sequence while the "treated" are individuals officially recognized as disabled between the first and second years of the sequence, with the authors insisting on the objectivity of the disability measure. The matching was carried out on observable characteristics over the first year and matching variables correspond to the characteristics susceptible of influencing the occurrence of a disability. They then compare the different outcomes (unemployment, employment...) between the treated and the untreated in t_2 , t_3 and t_4 and obtain the following results: disability does not lead to a reduction in earnings nor in hours worked, at least during the three years following the

occurrence of a disability, when the disabled person remains employed; becoming disabled reduces the probability of being employed by 9% and approximately 13% for those with a high degree of disability three years after its onset. Nonetheless, this reduction in the probability of being employed is not accompanied by an increase in the probability of being unemployed, which could be interpreted in terms of a “voluntary” employment exit.

More than disability *stricto sensu*, Garcia-Gomez (2011) studied the impact of a health shock on labour-market outcomes in nine European countries on the basis of the ECHP. The author notably uses the propensity score method with two consecutive health state measures enabling an estimate of the occurrence of a health shock (the perceived health deterioration and illness prevalence) and targets test and control groups depending on the sequence during which the health shock occurred. He thus studies the health shock over three years, considering in t_1 a person in good perceived health and in employment in t_1 and t_2 . The treated group is that which is in poor health in t_2 and t_3 , which implies that the shock lasts at least until t_3 while individuals in this group were in good health in t_1 . The control group is in good perceived health in t_1 , t_2 and t_3 . The results, obtained by applying matching methods, suggest that health shocks have a significant causal effect on the probability of employment: persons suffering from a health shock are much more susceptible of leaving their job and transiting through disability.

In France, using cross-sectional French data, Tessier and Wolff (2005) analyse the population aged 25 to 55 using a discrete time simultaneous equation model. The authors clearly establish the impact of health on labour market participation from an individual's entry into employment. On the other hand, professional activity does not appear to have an impact on health. Barnay and Legendre (2012) try to establish from a model of simultaneous equations and a latent variable model (Simultaneous bi Ordered probit) a full explanation of the relationship between health and occupational status. The results corroborate three assumptions: a *healthy worker effect*, a negative causal effect of occupational integration on disease prevalence, and positive causal effect of occupational integration on self-perceived health and activity limitation.

Moreover, still using data from France, Duguet and Le Clainche (2012 b,c) developed a series of studies on the relation between chronic illnesses and employment. They show a negative causal effect of a health shock on the probability of being employed, in particular for low-skilled workers. Exploiting the 2006 Health and Professional Itinerary Survey (*Santé et Itinéraire Professionnel, SIP*) wave and by applying a differences-in-difference with exact matching method, they show that non-professional health events penalise low-skilled people more heavily. The latter is already weakened on the labour market and transiting more frequently from employment

to unemployment, while individuals possessing a secondary or higher level of education remain employed more often.

Previous studies consider that the disability is based on a self-reported indicator or from an administrative recognition. We can also assume that sick leave constitutes an objective inability to work. It is essentially the Scandinavian authors who studied the impact of sick leave on professional paths. Hansen (2000) shows a negative effect of taking sick leave on wage trajectory in Sweden but only among women, each additional sick day reducing their wage rate by 0.2%. Hesselius's study (2007) in Sweden stresses that an increase of sick leave and their frequency enhances the risk of unemployment. More recently, Markussen (2012) in Norway establishes that an increase of one percentage point in the rate of sick leave decreases the probability of being employed two years later. For those remaining in employment, the author also observes a negative impact of sick leave on wages.

4.2 Cancer onset effects on work

In a meta-analysis based on 26 papers using US and European data, de Boer *et al.* (2009) estimate the relative risk of unemployment of cancer survivors to 1.37 in reference to a healthy population, all other things being equal. In a review of 64 international articles Mehnert (2011) shows that the return to work of cancer survivors, on average, is equivalent to 40 % six months after the diagnosis, 62% after twelve months, 73% after eighteen months and 89% after twenty-four months. Conversely, the onset of cancer leads to a transitory or permanent exit from the labour market. At a given age and gender in Finland, the relative risk of early retirement is 2.2 for survivors of cancer of the nervous system, 2 for leukemia, 1.9 for tongue, 1.2 for breast and 1.1 for prostate (Taskila-Abbrandt *et al.*, 2005).

The negative impact of cancer on the career path passes mostly through functional limitations (Bradley *et al.*, 2002, USA) that may be specific, such arm pain for breast cancer (Quinlan *et al.*, 2009 in Canada , Blinder *et al.*, 2012, USA) as well as depressive episodes (Damkjaer *et al.* , 2011, Denmark), disorders of concentration and memory (Oberst K. *et al.*, 2010, USA) and more generally, more pronounced psychosocial risks (Cooper *et al.*, 2012, UK). These dynamics are more or less supported according to the nature of the initial endowments of human capital, the difficulty of working conditions before the illness but also the type of cancer (site, severity disease) and finally, the nature of the treatment (Mujahid *et al.*, 2011; Lindbohm *et al.*, 2011; Johnsson *et al.*, 2011; Blinder *et al.*, 2012). Past professional biography (unemployment or training episodes) can lead to stigmatizing effects on the careers of individuals (Heckman and Borjas, 1980; Tominey and Gregg, 2005) and, for some social groups, predicts the occurrence of professional cancers.

The work environment also influences the job quality after the onset of the disease. In a literature review, Feuerstein *et al.* (2010) stress the importance of improvements in the workplace in terms of schedule flexibility, social support from colleagues, social climate and job stress. Using French data Duguet and Clainche (2012a) show that the probability of RTW for French employees two years after the cancer's diagnosis increases when appropriate working conditions were implemented.

4.3 Impact of health on sick leave³⁰

Socioeconomic characteristics play a large role on sick leave determinants. Thus, women generally take longer and more frequent sick leaves than do men (in France – Chaupain-Guillot and Guillot, 2007; Ben Halima and Regaert, 2013; In Europe Union - Frick and Malo, 1008; Livanos *et al.*, 2010). They are thus more sensitive to economic incentives (compensation system effect) and are more influenced by unemployment (Henrekson and Persson, 2004; Ose, 2005). Moreover, the length of sick leaves increases with age, without them occurring more frequently. This surprising result can be partially explained by the existence of a *healthy worker effect*; employed seniors are healthier than those who are not employed.

Indeed, health status is equally a determining factor. A degradation of the health capital could lead to sick leave by making the individual unable to work. In addition, the preservation of health capital can benefit from periods of preventive sick leaves in order to avoid more damaging consequences on the individual's occupational status (Grossman, *op.cit.*). Case and Deaton (2005) explain that manual workers self report to be in the poorest health status. In France, Chaupain-Guillot and Guillot (*op. cit.*) demonstrated that a person suffering from a chronic disease or disability has a higher probability of taking sick leave. Furthermore, Ben Halima and Regaert (*op.cit.*) highlight that an individual with an acute chronic disease (ACD)³¹ takes longer sick leave. In the Shapiro-Stiglitz efficiency wage model (1984), the individuals whose utility positively depends upon wages and negatively upon effort would be less inclined to be voluntarily absent (*shirking model*) when the probability of finding a new job is lower. Thus, the critical wage (the minimum wage satisfying the *non-shirking* condition) is an increasing function of the expected utility associated with unemployment. Ben Halima and Regaert (*op.cit.*) demonstrate a negative relationship between wages and the length of sick leaves (in which case leisure is considered to be a normal good) by controlling those individuals with *ACD* while Chaupain-Guillot and Guillot

³⁰ This sub-section was partially co-written with S. Juin and R. Legal in a work in progress called "*Disparities in taking sick leave between sectors of activity in France: a longitudinal analysis of administrative data*" (see in references: Barnay *et al.*, 2014)

³¹ In France, the costs of 30 Acute chronic diseases (ACD) are fully paid by the social security.

(*op. cit.*) indicate that the impact of wages on the probability of absence in men is negative, corroborating the *shirking model*.

Concerning the type of work contract, a permanent contract increases the probability of returning to work (Ben Halima and Regaert, *op.cit.*). Women with a fixed-term contract have a lower probability of being absent (Chaupain-Guillot and Guillot, *op. cit.*). In economic theory, absenteeism results from a work-leisure trade-off in a neoclassical model of labour supply (Allen, 1981; Brown and Sessions, 1996). Within this framework, sick leaves could correspond to the differential between the contractual number of hours and the desired number of hours. For instance, women working part time (ensuring a better balance between family and professional lives) have a lower probability of absence (Chaupain-Guillot and Guillot, *op. cit.*).

Based on Shapiro and Stiglitz (1984), it is commonly argued that labour market uncertainty has a negative impact on absenteeism (in other words, absenteeism is countercyclical) but empirical evidence has to be more nuanced. We can assume that the unemployment rate constitutes a worker disciplining device and employees may fear losing their job if they report sickness. Nevertheless, the duration of sick leave is determining. Thus, Ose (2005) found that short-term absences (shorter than 3 days) do not depend on the unemployment rate while long-term absences do. Using micro-data from the EU LFS³² for 28 countries, Livanos and Zangelidis (2013) showed that a higher proportion of dependents persons (inactive and unemployed individuals) is associated to lower sickness absence, probably due to the pressure active people may experience. Afsa and Givord (2009), using French data, show that a high percentage of absenteeism among unskilled workers is, in fact, due to irregular working hours. Chaupain-Guillot and Guillot (*op. cit.*) reveal that a person unsatisfied with their work has a higher probability of absenteeism. Moreover, the positive relationship between the company's size and the probability of absence due to illness (Ben Halima and Regaert, *op. cit.*; Ose, 2005) seems to confirm the importance of working conditions. Nevertheless, this positive relationship could also reveal differences in checking policies or individual effort within the company.

5. Towards job Sustainability and satisfaction

Keeping in mind what we know about the interactions between employment, working conditions and health, policymakers face the following two objectives:

³² European Union's Labour Force Survey

1- For insiders, improving job sustainability and satisfaction by reducing the impact of unwanted professional shocks on health status and the exposure to arduous working conditions (subsection 5.1)

2- Increasing the (re)integration of outsiders (healthy or unhealthy persons) to avoid permanent exclusion from the labour market and negative effects of unwanted non-employment on health status (subsection 5.2)

5.1 Can labour market flexibility be made safer for health?

EU treaties and policy directives recognize the importance of preserving the health and safety of workers and maintaining their well-being: “*Work shall be adapted to individuals and not individuals to work*” (European Commission, 1989). The EU strategy 2007–2012 on health and safety at work restates the prime objective of “*an ongoing, sustainable and uniform reduction in accidents at work and occupational illnesses*” (European Commission, 2007). The EU Council adopted the requirement of “*improvement in the working environment to protect workers’ health and safety*”, putting an explicit responsibility on the employer to adapt the work to the individual, especially as regards to the design of work places, the choice of work equipment and the choice of working and production methods’ (European Commission, 1989). The question of choice is central.

European policies converge towards a single objective: job sustainability. This concept, referring to the ability of people in employment to maintain this situation throughout all of their career is one of the key guideline for public policies. Older European workers with disabilities are more likely to be employed if they benefit from higher rewards (Pollak, 2012). In its broader meaning, job sustainability refers to key factors affecting participation in paid employment, such as health, training, lifelong learning, availability of a care infrastructure, marketable skills and motivation. For this matter, several national policies have been implemented all over Europe. In the Netherlands, the Ministry of Social Affairs and Employment introduced the *Action Plan Healthy Business*, aiming at promoting primary, secondary and tertiary prevention of the physical and psychosocial workloads. In Italy, the Ministry of Labour launched a campaign tackling work-related diseases, with a special focus on musculoskeletal disorders and respiratory diseases. The Davy report in France granted security to workers when changing jobs.

The empirical economic literature clearly invites employers to take better account of the worker preferences when setting the working time and the number of hours worked. This chosen flexibility could decrease the negative effects of work on health. Indeed, part-time working can be a worker’s choice or it can be involuntary. While 25% of EU27 workers are employed part time, this proportion varies greatly from 49% in the Netherlands to about 25 % in Austria, Belgium,

Denmark, Germany, Ireland, Norway, Sweden and the UK. In the Netherlands, about one quarter of men work part time and one third of women. Working-time preferences differ among European countries. EWCS 2010 suggests that the proportion of workers satisfied with their working time varies across countries: 71% in Bulgaria, 64 % in Romania, between 60 % and 62 % in Luxembourg, Belgium and Poland, but only 38% in Sweden. 31% of European workers would prefer to work less per week than they currently are (49 % in Sweden, 44% in Greece and 41% in Denmark *vs.* 17% in Bulgaria and 26% in Belgium and Italy). Finally, 14% of European workers would prefer to work more per week than they currently are. The motivations for reduced working time can be explained by poor health status care needs, harsh working conditions or concern for a better balance between professional and personal life. Motivations for increased working time may come from an income effect and/or a high job satisfaction. It seems that the use of free time is different according to social class preferences (Bassanini and Caroli, *op.cit.*). Several hypotheses can be proposed. Accordance with the model of Grossman, saving time given to the upper classes, who decide to work less, allowing them directly produce good health (care consumption) and also indirectly through utility-related better reconciliation of private and professional lives. The effect of part-time work dominates the loss of health induced by a reduction in income. In contrast, among the disadvantaged classes part-time work can appear more undergone. The negative effect of the loss of income on health effects dominates the other. A better understanding of these behaviours could be a support tool for health at work.

Moreover, with the growth of specific strains on workers, such as organizational and psychosocial risk factors, the impact of work on mental health is becoming stronger. In 2008, a *European Pact for Mental Health and Well-being* was established at the EU level, and focuses on the improvement of work organization and the hierarchical practices in order to promote mental well-being, to assess and prevent the impact of specific behaviours such as stress, violence, harassment and drug use, and finally to help people suffering from mental disorders to return to the labour market.

Mental health becomes a major issue owing to the development of new technologies, management methods, activity controls (quality standards, processes rationalization, etc.) as well as contacts with the public. Some European countries already implemented specific policies to deal with these new threats of work. In the Netherlands, the *Safe Public Service* program aims at reducing violence towards public employees. Belgium launched a campaign in order to reduce stress at work and violence, including that shown on TV spots. Some policies are targeting strains resulting from poverty and insecurity, as a noticeable proportion of workers report experiencing

great difficulties in making ends meet when in the context of a high unemployment rate. Thus, the *European platform against poverty and social exclusion* goal is to support work and help people out of poverty: by 2020, at least 20 million people should be pulled out of social exclusion.

Finally, within this specific topic on mental health, Cottini and Lucifora (*op.cit.*) show that the efficiency of health care systems (in terms of medical density, GP visits, beds available for psychiatric care, health care expenditure per capita) and labour market (*e.g.* employment protection legislation, unemployment benefits) seem to allow a better trade-off between job quality and mental health. They show that these characteristics of the healthcare market and the labour market appear to protect such countries as France and the Netherlands but do the opposite for Sweden.

5.2 Avoiding health-scarring effects and easing labour-market reintegration

It is necessary to invest in ongoing training from the beginning of a professional career to offset adverse health shocks. In Europe, more than a half of the working population reports a good match between their skills and what their job requires. However, younger workers and those using information and communication technologies report the need for training more often. Many proposals have also been made to encourage lifelong learning and to enable workers to develop their employability. An ‘Agenda for new skills and jobs’ is proposing reforms in order to help people to gain the right skills for future jobs in Europe. This programme was followed in several countries, such as Austria and Italy, by specific national reforms. Another programme called ‘Youth on the move’ targets young students and trainees. It proposes to gain experience on the job market by increasing mobility and promoting education in Europe. A programme also targeting youth was implemented in the UK.

Austria and Hungary worked on policies specifically aiming at people at risk of losing their job, or people not being able to find a job due to their health status. Finland made arrangements for the rehabilitation of workers after a sickness absence. France has adopted policy initiatives going in this direction such as the 2005 Law for equal rights and opportunities, the participation and citizenship for the disabled that completes 1987 law on behalf of employment for people with disabilities³³. Econometric studies show that reducing social security contributions for employers who hired disabled people allows an increasing employment rate in Spain and demonstrates efficacy of specific measures.

³³ Law 87-517 of 10 July 1987 made it compulsory for all employers (public and private) having over 20 paid workers, assessed as full time equivalent workers, to employ disabled workers (*OETH*) representing at least 6% of the total employees, under penalty of financial sanctions (with the exception of the public sector).

The literature review shows a negative impact of retirement on mental health. To avoid these adverse effects, retirement should be a gradual and chosen path. It should, therefore, develop opportunities to promote work after retirement and the reversibility of retirement. This phenomenon is growing in Europe. From 2005 to 2011, most European countries experienced an increase of employment rates among 65 to 69-year-olds, particularly in Finland, the UK, Lithuania, Germany and Austria. Flexible work arrangements have been identified as crucial in facilitating post-retirement work (Reday-Mulvey, 2005). A natural way to target work after retirement is to facilitate self-employment for 65 to 69-year-olds.

To conclude, it seems desirable to combine flexibility and employment security by taking into account individual preferences in Europe. As Origo *et al.* (2009) showed after properly controlling for endogeneity, *“a temporary but secure job (hence, the lack of only job stability) seems preferable to the combination of a permanent but insecure job (that is, the lack of only job security)”*. A search field is still largely under invested. It is a question of one hand if health is affected by instability of employment or income instability and, on the other hand, to better identify the trade-off between loss of income and increase in job satisfaction. For instance, if instability is primarily related to income, then a strategy of flexicurity with generous unemployment or disease benefits or over a short period would allow individuals to smooth their consumption of health care even in case of loss of job and be a good strategy against the negative effects of employment shocks on health.

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