OECD Social, Employment and Migration Working Papers
No. 175

Measuring Labour Market Security and Assessing its Implications for Individual Well-Being

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https://dx.doi.org/10.1787/5jm58qvzd6s4-en

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Organisation for Economic Co-operation and Development **18-Jan-2016**

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MEASURING LABOUR MARKET SECURITY AND ASSESSING ITS IMPLICATIONS FOR INDIVIDUAL WELL-BEING

OECD SOCIAL, EMPLOYMENT AND MIGRATION WORKING PAPERS NO. 175

Alexander Hijzen & Balint Menyhert

JEL Codes:I31, J08, J64, J65

This paper has been produced with the financial and substantive assistance of the European Union, as part of the OECD project "Defining, Measuring and Assessing Job quality and its Links to Labour Market Performance and Well Being" [VS/2013/0108 (SI2.666737)].

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JT03389048

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ACKNOWLEDGEMENTS

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The paper draws and extends on the analysis of labour market security in Chapter 3 of *OECD Employment Outlook 2014* and Chapter 5 of *OECD Employment Outlook 2015*. The authors are grateful for the generous contributions and useful suggestions by Andrea Bassanini, Stephane Carcillo, Sandrine Cazes, Boris Cournede, Martine Durand, Paolo Falco, Rodrigo Fernandez, Andrea Garnero, Sean Gibson, Herwig Immervoll, Hande Inanc, Mark Keese, Christine Le Thi, Catherine Mann, Pascal Marianna, Sebastien Martin, Anne Saint-Martin, Stefano Scarpetta, Cyrille Schwellnus, Paul Swaim and Céline Thevenot.

ABSTRACT

This paper provides a comprehensive discussion of the labour market security dimension of the OECD's job quality framework, thereby complementing the analysis in Chapter 3 of the *OECD Employment Outlook 2014* and Chapter 5 of the *OECD Employment Outlook 2015*. It makes three main contributions. First, it provides an in-depth discussion of the definition and measurement of labour market security. and discusses in detail the various methodological issues surrounding its measurement. Second, it offers a comprehensive statistical portrait of labour market security across countries, socio-economic groups and over time. Third, it investigates the statistical relationship between labour market insecurity and subjective measures of well-being. Importantly, we find that the risk of unemployment has a detrimental effect on the well-being of employed workers, and that this reflects to an important extent the risk of staying unemployed for a prolonged period of time. Policymakers should therefore focus not only on reducing the level of unemployment, but also on speeding up unemployment turnover at a given level of unemployment. Unemployment insurance also mitigates the adverse effect of unemployment risk, and particularly that of long-term unemployment, on the well-being of the employed.

RÉSUMÉ

Ce papier propose une discussion complète autour de la sécurité du marché de travail, une des dimensions du nouveau cadre pour la qualité d'emploi de l'OCDE. Il complète ainsi l'analyse du Chapitre 3 de *Perspectives de l'emploi de l'OCDE 2014* et celle du Chapitre 5 de *Perspectives de l'emploi de l'OCDE 2015*. Notre papier apporte trois contributions principales. Premièrement, il propose une discussion approfondie de la définition et la mesure de la sécurité sur le marché du travail. Deuxièmement, il donne un portrait statistique complet de la sécurité sur le marché du travail dans différents pays, groupes sociodémographiques ainsi qu'au fil du temps. Troisièmement, il étudie la relation statistique entre la sécurité sur le marché du travail et des mesures subjectives de bien-être. Un des résultats les plus importants est que le risque de chômage a des effets négatifs sur le bien-être des personnes employées, ce qui reflète à un degré important le risque de rester au chômage pour une période prolongée. Les décideurs politiques devraient donc, non seulement se concentrer sur la réduction du niveau de chômage, mais aussi sur l'accélération de la rotation des chômeurs à tout niveau de chômage. L'assurance chômage quant à elle attenue aussi les effets négatifs du chômage, et surtout du chômage de longue durée.

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1. INTRODUCTION

1. The efficient reallocation of workers across firms and sectors is crucial for economic growth and stability. However, the continuous process of job reallocation also entails important adjustment costs to workers and may give rise to worker concerns over labour market insecurity. Indeed, when workers are asked to state their preferences with respect to different aspects of work, as is done, for example, in the European Social Survey (ESS) or the International Social Survey Programme (ISSP), they consistently rank job security as the most important item in almost all countries (Green, 2009; OECD, 2011a). Consistent with this, labour market insecurity has been shown to have detrimental effects on individuals' well-being and health (Nolan et al., 2000; Green, 2011). Moreover, the implications of insecurity may go well beyond the well-being of workers: it may affect firm outcomes by reducing worker retention rates, investment in firm-specific skills and productivity as well as society at large by shaping people's political views, social unrest, consumer confidence and saving behaviour. For these reasons, labour market insecurity represents one of the three principal dimensions of the OECD's new framework for measuring and assessing job quality (OECD, 2014).

2. The new OECD framework on job quality focuses on those aspects of employment that are most important for workers' well-being. Building on the influential report by the Commission on the Measurement of Economic Performance and Social Progress to identify the key dimensions of employment that matter most for working individuals, the new framework is based on three policy-relevant complementary factors that determine workers' well-being: i) *earnings quality* which refers to the extent to which employment contributes to the material living standards of workers, with a particular emphasis on the case of low-wage workers; ii) *labour market security* which captures those aspects of employment that are related to the risks workers face in the labour market and their monetary consequences; iii) *quality of the working environment* which captures the non-economic aspects of job quality and includes factors that relate to the nature and content of work performed, working time arrangements and workplace relationships.

3. This paper provides a comprehensive discussion of the labour market security dimension of the OECD's job quality framework, thereby complementing the analysis in Chapter 3 of the *OECD Employment Outlook 2014* and Chapter 5 of the *OECD Employment Outlook 2015*. It makes three main contributions. First, it provides an in-depth discussion of the definition and measurement of labour market security. and discusses in detail the various methodological issues surrounding its measurement. Second, it offers a comprehensive statistical portrait of labour market security across countries, socio-economic groups and over time. Third, it investigates the statistical relationship between labour market insecurity and subjective measures of well-being. Importantly, we find that the risk of unemployment has a detrimental effect on the well-being of employed workers, and that this reflects to an important extent the risk of staying unemployed for a prolonged period of time. Policymakers should therefore focus not only on reducing the level of unemployment, but also on speeding up unemployment turnover at a given level of unemployment. Unemployment insurance also mitigates the adverse effect of unemployment risk, and particularly that of long-term unemployment, on the well-being of the employed.

4. The paper proceeds as follows. Section 2 briefly discusses the main elements of the OECD framework on job quality. Section 3 outlines the proposed concept of labour market insecurity and discusses its advantages over alternative approaches. Section 4 highlights the empirical and measurement issues associated with each component of the labour market insecurity indicator and presents the country-level results across the OECD. Section 5 documents the variability of labour market insecurity over time as well as across socio-economic groups. Section 6 investigates the empirical relationship between labour market insecurity and subjective well-being using a semi-aggregated dataset of worker groups. Section 7 concludes by discussing the most relevant policy implications.

2. A BRIEF OVERVIEW OF THE OECD FRAMEWORK ON JOB QUALITY

5. The new OECD framework on job quality focuses on those aspects of employment that are most important for workers' well-being. Drawing on the influential report by the Commission on the Measurement of Economic Performance and Social Progress to identify the key dimensions of employment that matter most for working individuals, the new framework is based on three complementary and policy-relevant factors that crucially determine workers' well-being and allow for a comprehensive assessment of job quality.[1]

- *Earnings quality* refers to the extent to which employment contributes to the material living standards of workers and their families. While the average level of earnings provides a key benchmark for assessing the degree to which having a job ensures good living conditions, the way earnings are distributed across the workforce also matters for well-being. Therefore, the OECD measures earnings quality by a synthetic index that accounts for both the *level* of earnings and their *distribution* across the workforce.

- *Labour market security* captures those aspects of economic security that are related to the risk of job loss and its consequences for workers and their families. For OECD countries, labour market insecurity is defined in terms of the risk of becoming unemployed and its expected cost. The latter depends both on the expected duration of unemployment and the degree of public unemployment insurance. Labour market security is therefore defined in terms of the *risk of unemployment*, which encompasses both the risk of becoming unemployed and the expected duration of unemployment, and *unemployment insurance*, which takes into account both benefit coverage among the unemployed and benefit generosity

- *Quality of the working environment* captures non-economic aspects of job quality and includes factors that relate to the nature and content of work performed, working-time arrangements and workplace relationships. Jobs that are characterised by a high level of job demands such as time pressure or physical health risk factors, combined with insufficient job resources to accomplish job duties, such as work autonomy and good workplace relationships, constitute a major health risk factor for workers. Therefore, the OECD measures the quality of the working environment by incidence of *job strain*, which is a combination of high job demands and few job resources.

6. Each of these dimensions of job quality touches on important and long-standing policy areas and debates. For example, earnings quality depends on the role of growth-promoting policies, the accessibility and quality of education and the nature of wage-setting institutions. The degree of labour market security is determined by the interplay between employment protection, unemployment compensation systems and active labour market policies. The quality of the work environment not only affects workers' well-being and health, but also has direct economic implications in terms of productivity or public health expenditures. Analysing all these aspect simultaneously in a comprehensive manner, the job quality framework allows for a more nuanced assessment of labour market performance as well as the complex role of policies and institutions. Moreover, it may even call the attention of policy makers to certain aspects of labour market that have received less scrutiny in the past (e.g. preventive health systems).

1. The key aspects of well-being identified by the Commission are the following: "material living standards"; "insecurity of an economic as well as a physical nature" and "personal activities including work". The Commission's recommendations also served as the starting point for the OECD's flagship initiative of the multi-dimensional measurement of well-being *How's Life?*.

7. While the three dimensions of job quality (e.g. earnings quality, labour market security and quality of the work environment) are key elements of the new framework, their actual measurement is flexible and can be adapted according to the purpose for which they are being used, the scope of the analysis and the availability of data. In order to ensure that indicators of job quality remain conceptually sound and relevant for policy, the framework embraces the following three guiding principles:

- Focus on *outcomes* experienced by workers as opposed to drivers of job quality. This is because outcomes are what ultimately matter to workers and policy makers, and their relationship with the institutional drivers is often loose and depends on many different factors.[2]

- Take an *individual perspective* in the sense that all indicators are defined at the level of the individual worker. This allows going beyond average tendencies and exploring the differences in job quality across the workforce.

- Favour as much as possible the *objective* features of job quality that can be observed by a third party. This is because using objective measures ensure better comparability of indicators across countries, groups and over time than those derived from the subjective assessment of individuals.

3. A COMPREHENSIVE CONCEPT OF LABOUR MARKET SECURITY

8. This section outlines the conceptual foundations of the labour market security dimension of the OECD job quality framework. By taking a well-being perspective and following the aforementioned guiding principles, the proposed approach captures the key elements of labour market security that matter the most for workers' quality of life.

3.1. Previous literature

9. Labour market security is often measured in terms of the incidence of temporary work or the proportion of short-tenured workers in employment (OECD, 2013). While both indicators focus on important determinants of job loss, they do not take account of the expected costs associated with it. Further shortcomings involve the incidence of temporary work being primarily a measure of labour market duality rather than labour market security (see Chapter 4 of OECD, 2014), and the incidence of short job tenure being more closely related to voluntary movements between jobs than to job loss *per se*. Moreover, the incidence of temporary work and short-tenured employment tend to decrease during recessions (as temporary and short-tenured workers are typically among the first to lose their job in a downturn) so that measuring job security based on these indicators can be very misleading.

10. Eurofound (2012a) takes a more sophisticated approach by proposing a synthetic indicator of "prospects" based on the individuals' self-reported perceptions about job security, career prospects and contract quality. It has several appealing features: the focus on individual workers and their outcomes, the forward-looking nature of the indicator as well as the fact that all of its components are measured using a single dataset. However, the reliance on subjective expectations about job security and career advancement makes it difficult to compare results across countries and worker groups. Moreover, it is not

2. It is worth noting that the distinction between outcomes and drivers depends on the context and is not always clear-cut. For example, in the context of labour market security, unemployment benefits can be considered both an outcome of job quality (in the sense that they constitute an important source of income for those workers out of work) and a driver of job quality (through their broader implications for labour market security through behavioural incentives concerning employment mobility and job search activity).

entirely straightforward to interpret what is captured by each of the questions related to job security and how robust the overall indicator is to different aggregation methods.

11. The choice of using subjective or objective measures in the case of labour market security is not straightforward. Subjective measures of job security have been found to yield considerable predictive power about future events. For example, subjective expectations about the probability of losing one's job and that of finding a new job after job loss have been found to yield considerable predictive power over actual job loss and job finding rates (Manski and Straub, 2000; Dickerson and Green, 2012). Moreover, several studies have shown that subjective expectations about job security can be used to predict economic behaviour in terms of consumer spending and saving behaviour (Benito, 2004; Lusardi, 1998; Stephens, 2004) or earnings growth and working bargaining power (Campbell et al., 2007). Job security perceptions also have been shown to be associated with subjective well-being and health outcomes (Nolan et al., 2000; Wichert, 2002). Indeed, the main interest in subjective relative to objective expectations derives from their importance in determining economic behaviour and individual outcomes. However, they are arguably less useful for the purposes of comparing job security across countries and groups due to the role of personality and cultural traits in shaping expectations. For this reason, we measure labour market security through objective and directly measurable factors.

3.2. The OECD measure of labour market security

12. The starting point for the approach taken in this paper is that individuals' concerns over labour market insecurity largely reflect the risk of unemployment and are best formulated from a cost perspective.[3] This is in line with the recommendations by the Commission on the Measurement of Economic Performance and Social Progress, which point out that "economic insecurity due to unemployment" is not entirely caused by the loss of a job *per se*, but also by the frequency and duration of consecutive unemployment spells and their consequences in terms of earnings losses (Stiglitz et al., 2009). While the importance of expected costs has been emphasized in several previous studies (OECD, 1997; Anderson and Pontusson, 2007; De Cuyper et al., 2008; Green, 2011), it has not been taken up in frameworks for the measurement of job quality.

13. Our proposed method thus goes beyond the current job and the probability of losing it and also takes account of individuals' prospects while out of work. In particular, we consider the expected cost of job loss to depend on (1) the probability of becoming unemployed, (2) the expected duration of unemployment, and (3) the degree to which unemployment benefits compensate for lost earnings during unemployment. This concept is based on three important modelling choices. First, job displacements that do not lead to unemployment (but are followed by immediate re-employment or inactivity) are not considered. Second, it is assumed that reductions in future (expected) earnings due to job displacement can be ignored.[4] Third, moral hazard issues associated with unemployment insurance are ignored, implying that all transitions from employment to unemployment are considered involuntary, and that job-search and job-retention efforts are independent of the degree of unemployment insurance provided.[5]

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3. It is worth noting that this concept of labour market insecurity may be too reductive for emerging economies where the risk of extremely low-paying employment may be an equally important source of labour market insecurity as that of unemployment. See Annex 2 of this paper and Chapter 5 of the *OECD Employment Outlook 2015* for more detailed discussion and analysis.

4. While this represents a potentially important cost component (Jacobson et al., 1993), evidence also suggests the bulk of the well-being costs of job displacement are more immediate and not necessarily earnings-related (Kuhn, 2002; OECD, 2013).

5. While workers' transition rates into and out of employment are certainly influenced by the availability and generosity of unemployment insurance, considering all unemployment as involuntary may not be wholly

14. The product of the first two above-mentioned cost components is defined as the risk of unemployment, while the third component constitutes unemployment insurance. As such, the risk of unemployment captures both the share of potential working time that an employed person is likely to spend in unemployment over a given period as well as the expected (uninsured) proportional loss in earnings due to unemployment. Unemployment insurance, on the other hand, measures the expected proportional reduction in risk through public insurance. The overall labour market insecurity indicator is then defined as unemployment risk times one minus unemployment insurance, and measures the expected proportional loss in earnings due to unemployment.

15. An important methodological choice concerns our singular focus on the financial costs associated with unemployment. This is not ideal since the well-being impact of unemployment risk has been widely documented to go beyond the loss of income (e.g. Clark and Oswald, 1994; Winkelmann and Winkelmann, 1998; Clark, 2003). However, it is far from obvious how the non-material (physical or psychological) costs of unemployment could be accounted for.[6] It is worth noting instead that the proposed measure of insecurity has some appealing properties even if the well-being consequences of unemployment go well beyond reductions in income. For example, as long as the non-pecuniary costs of unemployment are constant and the same for all, rankings of insecurity are not affected by the inclusion of the non-pecuniary costs of unemployment.[7] Furthermore, if the costs of unemployment are largely non-pecuniary, the measure of unemployment risk that will be discussed below may still be an appropriate measure of labour market insecurity to the extent that the non-pecuniary cost of unemployment are proportional to the duration of unemployment.

4. MEASURING LABOUR MARKET INSECURITY AND ITS COMPONENTS ACROSS THE OECD

16. Measuring insecurity on the labour market requires both aggregate and individual-level data. Aggregate sources are most suitable for the purpose of cross-country comparisons since these have the widest country coverage and are often derived from official labour market statistics. Individual-level sources, on the other hand, allow for measuring labour market insecurity and its components by socio-economic groups. They are also more suitable for analysing the joint distribution of unemployment risk and insurance across the workforce and exploring implications of those for subjective well-being. This section discusses the empirical measurement of labour market insecurity as well as its two main components, unemployment risk and unemployment insurance, for all OECD member states.

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unrealistic. For example, Chetty (2008) shows that the positive correlation between the duration of unemployment spells and the length of the benefit eligibility period may not necessarily suggest that benefits substantially distort the job search efforts of the unemployed through moral hazard, but can also reflect the impact of unemployment benefits on relaxing liquidity constraints. As far as discretionary quits from the workplace are concerned, there are severe penalties in many OECD countries (e.g. non-eligibility for unemployment benefits) that considerably reduce its appeal among most workers.

6. One possible solution would be to assign a set of weights to the unemployment risk and insurance components when combining them into an overall measure of labour market insecurity. However, it is not known what these appropriate weights should be in practice. Moreover, selecting a given set of weight in an arbitrary way automatically implies taking a stance on the nature and importance of non-material factors driving overall well-being. For these reasons, this agenda is not pursued in this paper.

7. There is some indication that the non-pecuniary costs of unemployment may differ across individuals. For example, empirical evidence shows that well-being of the unemployed varies by the relative importance of individuals' economic and psychological need for employment (Nordenmark and Strandh, 1999) and that individuals with strong employment commitment are more likely to report poor mental health outcomes (Nordenmark, 1999).

4.1. Unemployment risk

17. In order to measure unemployment, we focus on the objective risk that a given employed person will be unemployed in the subsequent period and the cost of becoming unemployed in terms of the average expected duration of unemployment. The overall risk of unemployment is then defined as the risk of becoming unemployed times the expected duration of unemployment.

18. In principle, individuals' transitions between states of employment and unemployment can be observed directly using longitudinal survey information. However, this information is not readily available for all OECD countries in a comparable manner. It also tends to be reported on an annual basis which prevents taking account of high-frequency transitions. For these reasons, a different approach is taken. In particular, unemployment risk and its components are measured using information on the duration of unemployment in combination with information on the stock of employment and unemployment. Following Shimer (2012) and Elsby et al. (2013) the risk of becoming and staying unemployed can be calculated through the monthly unemployment inflow and outflows probabilities, X_t and F_t as follows:

$$X_t = \frac{u_{t+1}^{<1}}{e_t} \quad \text{and} \quad F_t = 1 - \frac{u_{t+1} - u_{t+1}^{<1}}{u_t} \qquad (1)$$

where e_t refers to the total number of persons in employment, u_t to the total number of unemployed persons and $u_{t+1}^{<1}$ the number of newly unemployed persons at time *t+1*, i.e. those who have been unemployed for less than a month. The monthly unemployment inflow probability X_t is thus defined as the share of employed persons at a given point in time that becomes unemployed during the following month. This provides the first component of unemployment risk. The monthly unemployment outflow probability, on the other hand, is defined as one minus the share of unemployed persons at a given point in time that remains unemployed for at least another month.[8] Its inverse, $D_t \equiv 1/F_t$, measures the average duration of completed unemployment spells and provides the second component of unemployment risk. As mentioned above, the product of these two components measures the overall risk of unemployment, U_t :

$$U_t = \frac{X_t}{F_t} = X_t \cdot D_t \qquad (2)$$

19. It is worth noting that the proposed measure of unemployment risk is closely related to the unemployment rate. This is because, in a steady-state of constant unemployment when the number of employed workers transitioning into unemployment equals the number of unemployed flowing into employment, the unemployment rate can be directly expressed in terms of the respective transition rates, as follows:

$$\frac{u_t}{u_t + e_t} = \frac{x_t}{f_t + x_t} \approx \frac{X_t}{F_t} \qquad (3)$$

where x_t and f_t are the (continuous-time) hazard rates corresponding to the inflow and outflow probabilities X_t and F_t introduced above. As long as flows are measured at relatively short intervals, and to the extent that unemployment inflows are much smaller than unemployment outflows, the measure of unemployment risk employed here provides a good approximation of the steady-state unemployment rate.[9]

8. Using data available at lower than monthly frequencies, as is most likely the case, the number of employed and unemployed persons one month before may be inferred by interpolation using the appropriate weighted average of current and most recent past observations.

9. Indeed, the cross-country correlation between unemployment risk and the unemployment rate across is around 90 percent in the OECD.

20. This measure of unemployment risk may be interpreted in slightly different ways. The most straightforward interpretation concerns the share of time employed individuals can reasonably expect to spend in unemployment during a given period in the future. The law of large numbers implies that the average of these shares across individuals should be very close to the cross-sectional share of unemployment in the labour force. An alternative interpretation of unemployment risk is that it represents the cost of unemployment in the absence of insurance as measured by the expected proportional loss in earnings in terms of current earnings.[10]

21. Taking a flows-based approach to unemployment risk offers two important advantages. First, the risk of becoming unemployed and that of staying unemployed may have different implications for individual well-being. If this is the case then, for a given level of unemployment, the average level of well-being will depend on the incidence and duration of unemployment, i.e. the specific combination of unemployment inflows and outflows. Second, the risks of becoming and staying unemployed are affected differently by policies and institutions. While employment protection is typically found to have little impact on unemployment, which suggests that it affects inflows and outflows by approximately the same extent, income-support and activation policies affect unemployment mainly through their impact on the unemployment outflow probability (OECD, 2006). **Box 1** provides an overview of the technical assumptions that underlie the measurement of unemployment risk using the flow-based approach.

Box 1. **Assumptions for measuring unemployment risk**

The measurement of unemployment risk using information on the duration of unemployment spells requires making a number of assumptions.[1]

First, it is assumed that within groups individuals face the same risks of becoming and staying unemployed. Importantly, this implies that individual unemployment transitions within groups are considered random. This assumption seems reasonable in the face of available empirical evidence suggesting that most workers do not have reliable subjective priors about the degree of unemployment risk they are exposed to.[2] The restrictiveness of this assumption depends crucially on the level at which groups are defined and the way transition rates are calculated.[3]

Second, it is assumed that transitions between unemployment and inactivity are negligible, and hence all changes in the stock and composition of employment and unemployment data over time reflect transitions between employment and unemployment. Previous studies that have assessed the validity of this assumption typically suggest no major implications for the analysis of unemployment dynamics, either across countries or over time (Shimer 2012, Elsby et al. 2013). Relaxing this assumption either requires information on the previous labour market status of the newly employed and unemployed. In cross-sectional datasets, this information can only be obtained through the use of backward-looking questions, but these are not consistently available. In longitudinal surveys, this information can be obtained in principle by following individuals over time, but the typically low frequency of data can make inference misleading in practice.

Third, it is assumed that there is no time aggregation bias. This refers to the possibility that certain unemployment flows are unobserved because they are reversed within a given month. To the extent that the number of persons unemployed for less than one month at the end of the month is smaller than the number of persons who became unemployed in that month, this leads to an underestimation of both risk components. Time aggregation bias is particularly important for the unemployment inflow probability, which implies that the resulting estimate of unemployment risk is likely to be biased downward. The empirical relevance of this can be substantial: Nekarda (2009) and Nordmeier (2014) show that time aggregation can lead to an underestimation of transition rates by as much as 20% using monthly data. In the literature, a number of correction approaches have been proposed to deal with the issue (Fujita and Ramey, 2009; Shimer, 2012) but they are not pursued in this paper.[4]

10. The validity and relevance of this interpretation are somewhat compromised by the widespread empirical evidence that job displacement results in sizeable and sustained earnings losses after re-employment (Couch and Placzek, 2010). Moreover, the magnitude of these losses tends to depend on the length of the unemployment spell, with the long-term unemployed facing especially heavy penalties (Hijzen et al., 2010; Cooper, 2013). These second-order effects are not considered in the present framework.

Fourth, it is assumed that duration dependence does not matter. Duration dependence refers to the case when the unemployment entry (exit) rate is related to the duration of employment (unemployment) spells of individuals. As in the case of time aggregation discussed above, duration dependence is an issue primarily associated with discrete-time rather than continuous-time concepts of risk. In the present context, these matter because transition probabilities are likely to be duration-specific: inflow and outflow estimates depend both on the length of time over which they are calculated as well as the length of individuals' ongoing employment (unemployment) spells. Only when unemployment entry (exit) rates are unrelated to spell duration do all transition probability estimates correspond to the same average job-finding (job-losing) rate. In practice, duration dependence is usually negative as the long-term unemployed (employed) are less likely to find (lose) a job, implying that longer durations are associated with lower transition probabilities (Machin and Manning, 1999). In this paper, we calculate average monthly transition probabilities using quarterly durations by default to mitigate the problem of measurement error, but resort to monthly durations whenever the comparison of different probabilities indicates a strong presence of negative duration dependence.

[1] Some of these assumptions can be relaxed with additional work or when better data become available.

[2] For example, Dickerson and Green (2012) find that the perceived probability of job loss tends to be much higher than the actual one. The chance of re-employment, on the other hand, is often underestimated and is driven by uncontrollable factors from the workers' perspective to a large degree (Shimer, 2012; Fujita and Moscarini, 2013). Using group- and country-specific aggregates as an individual risk measure is further confirmed by Kroft et al (2014) who find that the tightening of the labour market in economic downturns typically has repercussions for the entire workforce, and that neither the observable characteristics of job seekers nor the unobservable differences among them are likely to capture much of the time variation in long-term unemployment rates (Ahn and Hamilton, 2014).

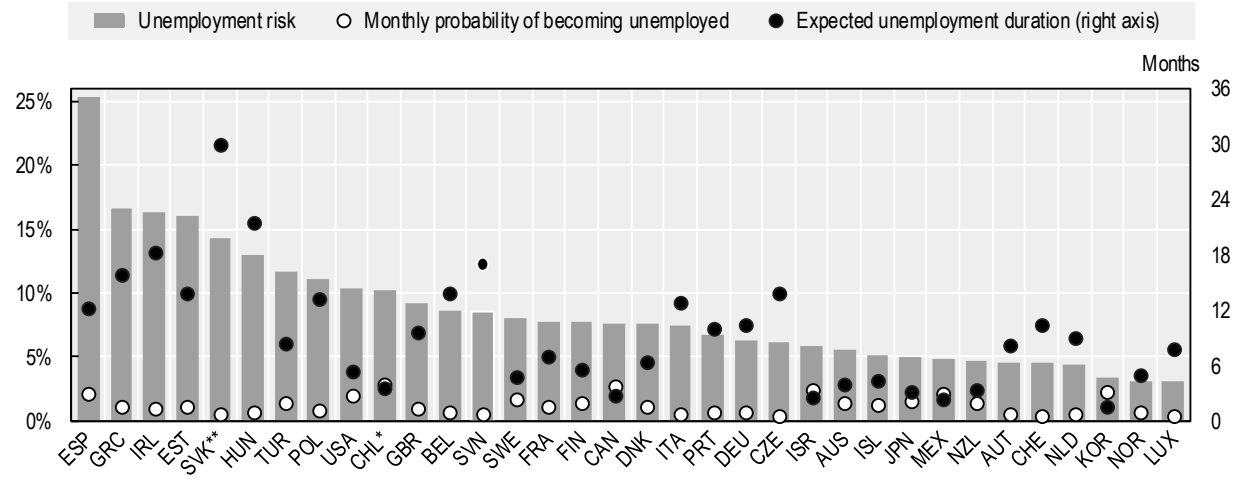
[3] Transition rates can be calculated directly in a non-parametric way (as introduced above) or through parametric estimation techniques. The latter method may impose strong restrictions on the estimated transition probabilities, but allows for obtaining estimates even for cells with no or few underlying observations. The non-parametric method treats each cells individually and thus requires a minimum number of observations in each of them for reliable estimation.

[4] These correction techniques are either based on the use of different data sources or require modelling in a continuous-time environment that may not be familiar to all readers. Moreover, the results obtained by the simplified approach and presented in this paper are very similar to those based on some of the more sophisticated methodologies.

22. **Figure 1** documents the risk of unemployment and its components across OECD countries using data for 2010.[11] It provides several important insights. First, there is abundant variation in unemployment risk across countries, reflecting substantial differences in labour market performance. Unemployment risk is highest in Estonia, Greece, Ireland, the Slovak Republic and Spain, where a typical worker could expect to spend more than two months in unemployment over the coming year. Unemployment risk is lowest in countries such as Korea, Luxembourg and Norway. Second, cross-country differences in unemployment risk reflect large variations in the probability of becoming unemployed and the expected duration of unemployment. The probability of becoming unemployed in a given month ranges between 0.4% (in countries such as Czech Republic, Luxembourg and Switzerland) and around 2.5% (in countries such as Canada, Israel and Korea) while the expected duration of unemployment extends from less than 3 months in Canada, Israel, Korea and Mexico to over 18 months in Ireland, the Slovak Republic and Turkey. Third, there are considerable cross-country differences in the flexibility of national labour markets, as indicated by the relationship between the two risk components within a country. For example, between two countries with similar overall risk profiles, unemployment spells are relatively short and evenly distributed in Canada, while they are much longer and more concentrated in Italy.

11. Throughout the paper, 2010 will be used as the reference year for most cross-country comparisons, even though more recent data are typically also available. This choice is motivated by the close proximity of this paper with Chapter 3 of the 2014 Employment Outlook that introduced the OECD job quality framework and presented the main quantitative results for all dimensions of job quality in that specific year. However, the present paper also discusses more recent trends in labour market insecurity using data up to 2013.

Figure 1. **Unemployment risk and its components across the OECD in 2010**



* Information for Chile concerns 2011.

**The expected duration of unemployment in the Slovak Republic is censored at 30 months

Source: OECD calculations based on the *OECD Unemployment Duration database* for all countries except for Chile, for which a national household survey (CASEN) was used.

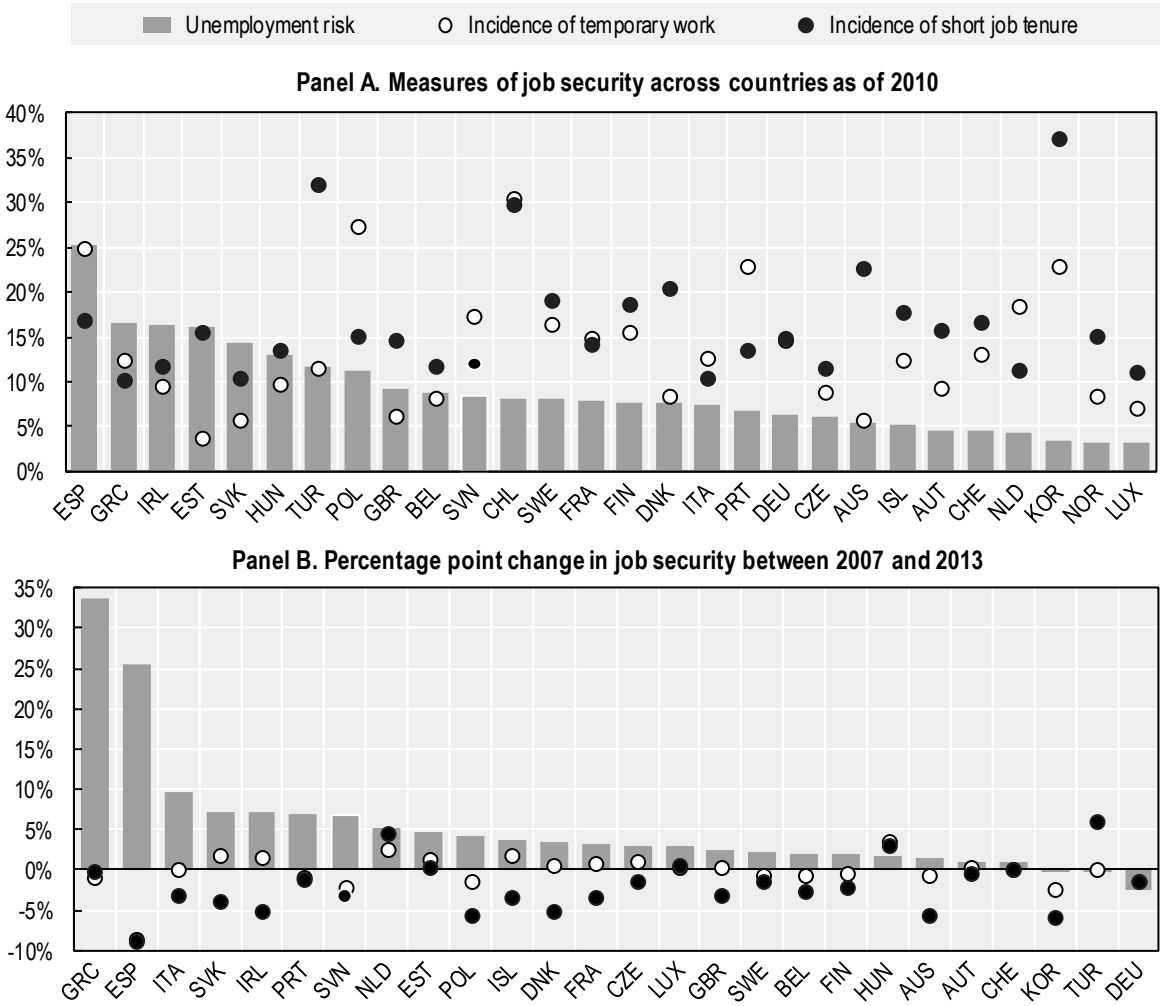
23. It is instructive to show how the proposed measure of unemployment risk relates to more conventional measures of job security used in the literature, such as the incidence of temporary work or the proportion of short-tenured workers in employment (OECD, 2013). While both of these indicators focus on important and objective determinants of the likelihood of job loss, they do not take account of the expected costs associated with it.

24. A comparison of these different measures of job security across countries and over time is presented in **Figure 2** below. Panel A shows that measuring job security through the share of temporary work or short job tenure may be misleading since these indicators are largely independent of the risk of unemployment.[12] For example, Korea scores low on unemployment risk despite experiencing one of the highest incidence of short-tenured or temporary employment, while workers in Greece and Ireland face the highest unemployment risk despite their below-average incidence of short-term tenure and temporary work. In fact, the incidence of temporary work is a more appropriate measure of labour market duality than of average job security (see Chapter 4 of OECD, 2014c), while the incidence of short job tenure is more closely related to the voluntary movements between jobs than to job loss *per se*.

25. Panel B plots the evolution of the same indicators between 2007 and 2013 by country. It shows that unemployment risk exhibited very different dynamic patterns during the crisis than the incidence of temporary work and short-tenured employment. While the risk of unemployment rose considerably over the period in almost all OECD countries, the incidences of short-tenured and temporary employment tended to decrease as inexperienced and irregular workers were typically the first whose jobs were destructed. This implies that using proxies based on the incidences of temporary or short-term employment for the purpose of monitoring job security over time can be highly misleading.

12. The cross-country correlations of the incidence of temporary work and short-tenured employment with respect to unemployment risk are very weak (7% and -16%, respectively). It is worth noting, however, that they are good indicators of job stability: both the incidence of temporary work and the incidence of short job tenure are strongly correlated with the monthly probability of becoming unemployed (the respective correlation coefficients are 86% and 40% across countries).

Figure 2. **The relationship between unemployment risk and alternative measures of job security**



Notes: Estimates for the incidence of temporary employment and the incidence of short-tenured jobs are based on all persons above 15 years of age working in dependent employment. Workers are considered short-tenured if the length of time in their current or main job or with their current employer is less than a year. Canada, Chile, Israel, Japan, Mexico, Norway, New Zealand and the United States are missing from one or both of these charts due to missing information on the incidence of short-tenured or temporary employment.

Source: OECD calculations based on the OECD Unemployment Duration database and the OECD Labour Force Statistics.

4.2. Unemployment insurance

26. The adverse well-being effects of unemployment can be mitigated by different means, such as formal insurance, financial risk-sharing within the household and providing emotional support. From a policy perspective, however, the most important insurance channels are public insurance schemes, which provide financial support to the unemployed and allow them to engage in meaningful job search or training activity. While a large number of cross-country comparative studies have analysed the role of unemployment insurance for well-being, these typically focus on the generosity of unemployment benefits in terms of the replacement rate of previous earnings (OECD, 2007). Albeit insightful, these studies do not consider many other factors that determine the effectiveness of unemployment insurance schemes in

absorbing earnings losses associated with unemployment: e.g. cross-country differences in the length of unemployment spells, the strictness of eligibility criteria, the take-up rate of benefits or the importance of social assistance. In an effort to measure unemployment insurance in effective terms, one therefore has to take account of these additional factors to the extent possible.

27. In order to measure unemployment insurance in effective terms, the traditional focus on benefit generosity is therefore extended in two different ways. First, all social protection programmes are considered that may provide income support to the unemployed and their families, including unemployment insurance benefits, unemployment assistance benefits and social assistance benefits.[13] Second, instead of focusing only on the generosity of these benefits, the corresponding coverage rates are also considered, with the aim of capturing factors such as the strictness of eligibility criteria, the duration adequacy of benefits and the ease of access to benefits for those who are eligible. The effective insurance rate for each benefit scheme is defined as the product of the relevant coverage rate and the average replacement rate over the entitlement period. Overall unemployment insurance is then defined as the sum of these cross-products across benefit categories. The resulting measure of effective unemployment insurance represents the share of earnings that employed workers can reasonably expect to retain during their eventual unemployment spell on average.[14]

28. There are two fundamentally different ways of measuring effective unemployment insurance in practice. First, one may use micro-level data that contain information on individuals' labour market status and a detailed breakdown of their income situation, including what type and amount of benefits they receive if unemployed. Unfortunately, such data are not available on a cross-country basis in a consistent way: integrated administrative datasets of this kind are either not existent or accessible for the majority of OECD countries, while (longitudinal) labour force surveys typically do not provide a detailed enough picture of the types of benefits individuals receive. Second, one may follow a rule-based approach and collect information on labour market regulations concerning benefit eligibility criteria, maximum benefit durations and benefit replacement schedules. To allow calculating individual or group–level measures of effective insurance, this information needs to be complemented with information of employed persons about their current earnings, previous earnings histories, expected unemployment duration and household composition.[15] While this would be the appropriate way of determining benefit entitlements of all currently employed persons, this requires very detailed information on the situation of employed persons and the taxes-and-benefits system which, for the time being, is not available on a consistent basis across OECD countries. The main problem lies with determining workers' eligibility to benefits during unemployment as this requires taking account of individual labour market histories (see **Box 2**).

13. Unemployment insurance benefits are in place in most OECD countries (except Australia and New Zealand) and provide financial support for a relatively short period of time during the initial phase of the unemployment provided that eligibility requirements related to previous employment record or earnings are met. In addition, several countries operate (means-tested) unemployment assistance schemes in order to alleviate the hardship of those unemployed who do not qualify for unemployment insurance benefits or have exhausted them. Finally, various social assistance programmes are made available for the unemployed in all OECD countries with the aim of providing a basic level of income.

14. Note that using group-level or country-level averages for measuring individuals' effective unemployment insurance is somewhat more problematic than in the case of unemployment risk presented in the previous section. This is because employed workers tend to be much better informed about their insurance possibilities than their risk prospects: they should know their employment history and eligibility status, the type of household they live in as well as their income situation. To the extent that these are systematically related to benefit recipiency and generosity, unconditional averages of these latter will, in general, deviate from individuals' true insurance rate as well as from the average of their respective group or country.

15. Note that doing this in the greatest possible detail would effectively involve conducting micro-simulations.

Box 2. **The relationship between coverage rates and eligibility for unemployment benefits**

Entitlements among employed persons to public income support schemes in the event of unemployment may be measured in terms of benefit eligibility among the employed or actual benefit coverage among the unemployed. From a conceptual point of view, the main difference between coverage and eligibility rates is that the former is likely to be lower as a result of non-take-up. Whether non-take up should be taken into account when calculating the unemployment insurance rate is not straightforward and depends on the set of factors responsible for it. If non take-up is driven principally by voluntary factors or is relatively rare, not accounting for is less problematic than if it is relatively common or involuntary for the most part.

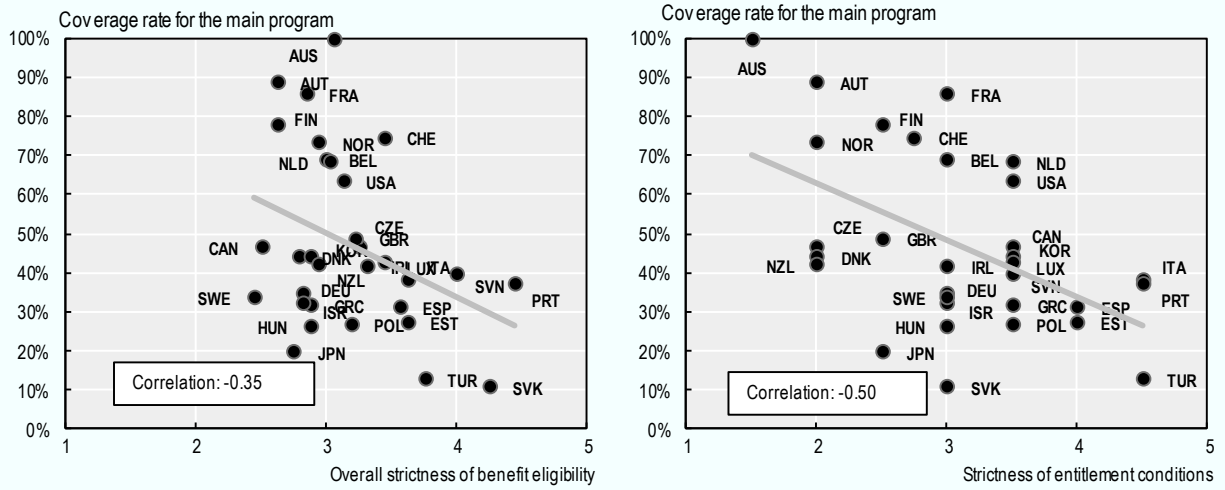
Available studies confirm that coverage rates tend to be considerably lower than eligibility rates. For example, Hernanz et al. (2004) show that non-take-up may be as high as 40% in the case of unemployment benefits, and may be even higher in the case of social assistance and housing programs. This is confirmed by Bargain et al. (2010) on Finnish data as well as a number of other studies cited by Matsaganis et al. (2008). To the best of our knowledge, however, there has been no systematic analysis of the reasons for non-take-up. This makes it difficult to determine whether non-take-up should be incorporated in the calculations or not.

Measuring benefit eligibility directly, while assuming that all non-take-up is voluntary would be a good alternative to the use of coverage rates in principle, but is difficult to do in practice. The main reason, as summarized by Venn (2012), is that eligibility is not directly observable and depends on a plethora of factors – ranging from entitlement conditions to job-search requirements and monitoring activity – that are complex and difficult to quantify. This becomes evident when eligibility rates are calculated based on individuals' employment histories as contained in panel surveys. Focusing only on whether employed individuals meet the minimum employment requirements during a given period to be eligible for benefits in a given country tends to yield eligibility rates that are very high. For example, eligibility rates calculated using the monthly calendar of EU-SILC are close to 100%, with little or no meaningful variation among worker groups or countries. As such, workers' employment history alone does not appear to be a sufficient statistic for benefit eligibility in practice, as other regulatory aspects may be equally important (e.g. regular social security payments, minimum contribution requirements).

A more informative approach for comparing benefit eligibility across countries may, therefore, be to focus on the national regulations that determine eligibility. Venn (2012) put forward a rule-based composite indicator of benefit eligibility that focuses on entitlement conditions, job-search requirements, monitoring of job-search effort as well as sanctions for refusing a job offer. Each of these dimensions is evaluated separately by a numerical score between 1 (least strict) and 5 (most strict). The overall indicator is a weighted average of these components. For the purpose of this paper, the most relevant component is the strictness of entitlement conditions, as these refer directly to the minimum employment/contribution record and the treatment of voluntary unemployment, while other dimensions mostly relate to the duties of the unemployed once they are receiving benefits.

In order to get an indication of the extent to which the cross-country variation in UB coverage rates is driven by differences in benefit eligibility and differences in take-up among the eligible, **Figure B.1** compares UB coverage with the indicator of the overall strictness of benefit eligibility (left panel) and the sub-component that relates to the strictness of benefit entitlement conditions (right panel). The left panel shows that the observed UB coverage rates for the main unemployment benefit scheme in a country are strongly and negatively related to the eligibility criteria score. Moreover, this relationship becomes even stronger if one focuses exclusively on the strictness of entitlement conditions, as shown in the right panel. These findings suggest that coverage rates capture a sizeable part of the cross-country variation in benefit eligibility and hence provide a reasonably good proxy for benefit eligibility.

Figure B.1. **Relationship between coverage rate and eligibility criteria across the OECD**



Notes: Data on the scatterplot concern 2010. Coverage rates relate to the respective main unemployment benefit scheme in each country. The overall strictness of benefit eligibility represents the weighted average of the relevant sub-indicators (concerning the respective categories of entitlement conditions, job-search and availability, monitoring and sanctions) and is evaluated on a numerical scale between 1 and 5, from the least strict (1) to the most strict (5). The strictness of entitlement conditions depends on employment record and sanctions for voluntary unemployment, and is evaluated on the same scale as the overall indicator.

Source: Calculations based on the *OECD's Social Benefit Recipients database* and information in Venn (2012).

29. We proceed in a pragmatic manner by combining elements of both approaches. In particular, we use the rule-based approach to measure benefit generosity which allows focusing on the detailed benefit package eligible individuals are entitled to. On the other hand, we use observational data on the share of the unemployed that receive some form of benefits with the aim of determining the size and relative importance of different benefit schemes in each country. Mixing the rule-based replacement rates with observed coverage rates thus enables the calculation of the effective rate of unemployment insurance in a reasonably reliable way.

Coverage rates

30. Measuring coverage rates by country and socio-economic group involves using different data sources. At the country level, coverage rates are obtained from the OECD's Social Benefit Recipients Database which allows calculating the ratio of the number of benefit recipients according to administrative records to the official (ILO-based) number of unemployed. The main advantages of administrative data relative to self-reported data on benefit recipiency are that information is available separately for each benefit category (unemployment insurance, unemployment assistance, social assistance) and that they are not subject to under-reporting of benefit receipt because of concerns over privacy or broader stigma effects. Such data, however, also have two important shortcomings. First, the target population of many benefit schemes does not correspond exactly to the officially unemployed, which can introduce considerable bias into the calculation of coverage rates. Moreover, it is possible in practice that an individual receives several different benefits at the same time. As a result, coverage rate estimates based on administrative data may be biased upward and even exceed 100% in certain cases. The second main shortcoming of administrative data is that it is available only at the country-level basis and does not contain a breakdown of benefit recipiency by socio-economic groups.

31. Benefit coverage rates at the group level are therefore calculated based on self-reported information from labour force surveys. The main advantage of such self-reported data is that the number of benefit recipients and unemployed are defined in a consistent manner. The main drawback, however, is that the classification of benefit categories is not nuanced enough: typically no information on social

assistance recipiency is provided, while unemployment insurance and unemployment assistance are usually treated as one. As a result, the ultimate group-level insurance rates can be defined only by having recourse to administrative data at the country-level: either for scaling up group-specific coverage rates to include social assistance benefits (by the appropriate average social assistance coverage rate in the country), or for breaking down the observed group-level composite coverage rate into separate coverage rates for unemployment insurance benefits and unemployment assistance benefits (according to the appropriate country-specific average shares).[16]In order to calculate country-level coverage rates by benefit category based on administrative records a number of assumptions had to be made. First, when measuring coverage at the country level, it is assumed that all benefit recipients are ILO unemployed. In practice, this is not necessarily the case as many countries use national definitions of unemployment to administer their benefits but also because not all benefits are targeted to the unemployed. This is most obvious in case of social assistance benefits which in many countries tend to be targeted predominantly at the inactive. Second, it is assumed that individuals can only receive one benefit at a time. Together, these two assumptions imply that coverage rates cannot exceed 100%. Therefore, when the sum of UI and UA coverage exceeds 100%, the latter is capped to the value that sets overall coverage to 100%, while SA coverage is capped when the sum of UI, UA and SA exceeds 100%.

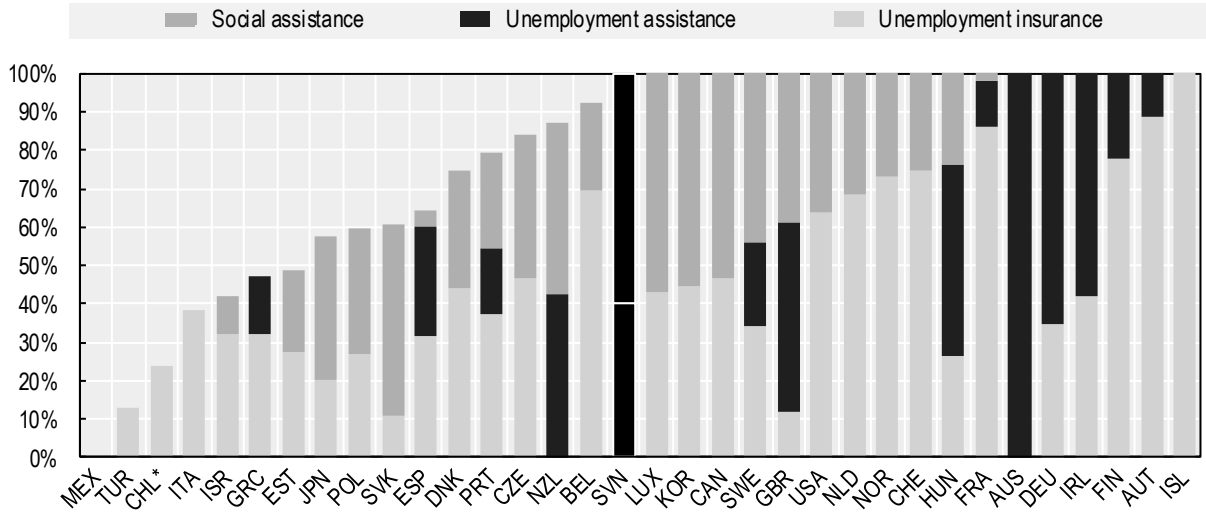
32. The resulting coverage rates based on administrative data for 2010 are shown in **Figure 3** by country and benefit category. Three important conclusions are apparent. First, there is considerable divergence within the OECD in terms of what share of the unemployed receive at least some income support from the government: while coverage is full in more than half of the member states, only a fraction of the unemployed are supported financially in countries such as Chile, Italy and Turkey, and none in Mexico.[17] Second, OECD countries are also very heterogeneous in terms of how their unemployment benefit systems are designed: while around half of them operate only unemployment insurance programs, many others have both unemployment insurance and unemployment assistance schemes in place, with the latter often surpassing the former in importance (such as in Germany, Ireland and the United Kingdom). Australia and New Zealand are exceptions in the sense that unemployment benefits in these countries consists entirely of unemployment assistance. Third, the role of social assistance for the unemployed differs importantly across countries. Interestingly, social assistance coverage tends to be relatively low in countries where unemployment benefit coverage is either very high (such as in Austria, Finland and Iceland) or very low (such as in Chile, Italy, Greece or Turkey). In most OECD countries, social assistance nevertheless provides an important source of income support to the unemployed.

16. The choice of how to construct unemployment insurance rate at the group-level may be motivated by whether the correspondence with the aggregate (country-level) figures is considered more relevant for the specific exercise, or the advantages associated with using only observed data and relying on as few assumptions (about how the take-up of different benefits are distributed across groups) as possible.

17 Mexico that has no nationwide system of unemployment benefits in place yet. The Mexican government, however, proposed in 2013 to establish one such scheme over the coming years.

Figure 3. **Coverage rate of unemployment benefits in OECD countries**

Benefit coverage rates by country and benefit category, 2010



Notes: The country ranking is based on the overall coverage rate in increasing order. In case this is the same across two countries, the sum of UI and UA coverage is considered, with priority given to UI over UA benefits. The figures for Chile concern 2011 values.

Source: OECD calculations based on the OECD's Social Benefit Recipients Database.

Replacement rates

33. Replacement rates express the share of individuals' income while unemployed relative to their previous disposable income, and therefore represent the expected degree of insurance conditional on receiving a given benefit. They are based on the OECD's Tax-Benefit models that make use of the complex set of legal rules in each member state to determine benefit entitlements of eligible individuals across a wide range of benefit types, household characteristics and unemployment periods. In particular, the overall replacement rate is calculated as the simple mean of the household-specific replacement rate across six different household types and two different (previous) earnings levels.[18]. For unemployment insurance, the applicable replacement rate during the first month of the unemployment spell was considered; for unemployment assistance, the replacement rate in the first month immediately after the country-specific maximum duration of unemployment insurance; for social assistance, the replacement rate in the 60th month of the unemployment spells.[19] Subsidiary forms of social transfers (of which the importance surpasses that of primary benefits in many countries, especially in the Anglo-Saxon world)

18 The six different household types considered are: single households, 1-earner married households, 2-earner married households, each with and without children. The two representative earnings levels considered for the calculations are 67% and 100% of the (gross) national average wage. In 2-earner households, the working spouse is assumed to earn 67% of the (gross) national average wage.

19 Benefit amounts associated with a given benefit category are usually fixed over the recipiency period for almost all countries over the recent period. As such, benefit payments in the respective selected single month for each benefit category (first month of recipiency in case of UI and UA, and the 60th month of the unemployment spell in case of SA) can be considered as representative for the whole recipiency period associated with a given scheme. In fact, the insurance figures presented in Chapter 3 of the 2014 Employment Outlook are based on taking the actual average across all months of recipiency for UI and UA, and are virtually identical to the figures presented in this paper.

such as family benefits, social and housing assistance or in-work benefits of working spouses are all considered in the calculation of the replacement rate.

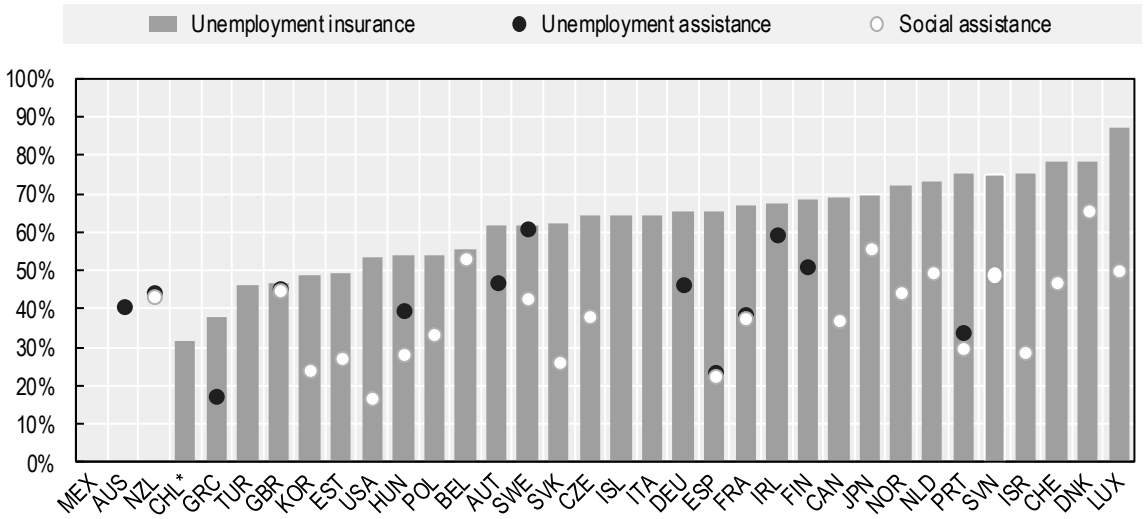
34. Three important points are worth noting concerning the way replacement rates are calculated. First, the calculated replacement rates are defined in net terms, as they express the share of individuals' disposable income while unemployed relative to their previous take-home earnings (net of taxes and benefits). Net instead of gross replacement rates are used because the former provide more relevant information from the perspective of the individual worker. Second, since the present focus is on employed individuals and public channels of insurance, the calculated replacement rates are specific to the single individual rather than the household. Since the standard outputs generated by the OECD Tax-Benefit calculator relate to the household, these had to be adjusted for our purposes. In particular, calculating individual replacement rates required that taxes and subsidiary transfers received by married household be split between the principal (unemployed) person and her partner.[20] Third, replacement rates in a country are specific to household types and earnings levels only, and do not directly depend on one's membership in a particular socio-economic group. Therefore, in an attempt to maintain consistency with the country-level figures, group-level replacement rates are calculated using the same approach as described above, assuming that household composition is identical across socio-economic groups. The only difference across groups concerns the representative earnings level, which was determined, for each socio-economic group, by the average earnings in the group relative to the national average, as calculated from labour force surveys.

35. The resulting replacement rates for 2010 are shown in **Figure 4** by country and benefit category. Similar to coverage rates, differences in the generosity of respective schemes across countries are rather large: while an unemployed worker, if eligible, retains more than 80% of her previous take-home earnings in Luxembourg on average, this number is no more than 40% in Australia, Chile, Greece or New Zealand. **Figure 4** also shows that unemployment insurance benefits are consistently more generous than either unemployment or social assistance, even though the wedge between them varies significantly across countries: while assistance benefits amount to little more than subsistence payments in Greece, Spain or the United States, they are worthy substitutes for the principal unemployment scheme in countries like Belgium, Denmark, Japan, Ireland, Sweden or the United Kingdom.

20. To achieve this, when calculating the (pre-unemployment) individual earnings, household-level gross earnings and taxes were split in proportion to the gross wage levels of spouses, while transfer payments were split inversely proportional to it – to reflect the fact that taxes are paid mostly by the relatively high-earner, while transfers are received mostly by the relatively low-earner. In case of benefits during unemployment, tax share of the principal person are made to reflect the share of unemployment benefits in household earnings, while the transfer share represents the inverse of this share.

Figure 4. **Net individual replacement rate of unemployment benefits in OECD countries**

Total replacement rates and their breakdown by benefit category, 2010



Note: The country ranking is based on the replacement rate associated with unemployment insurance. Calculations for Chile concern information as of 2011.

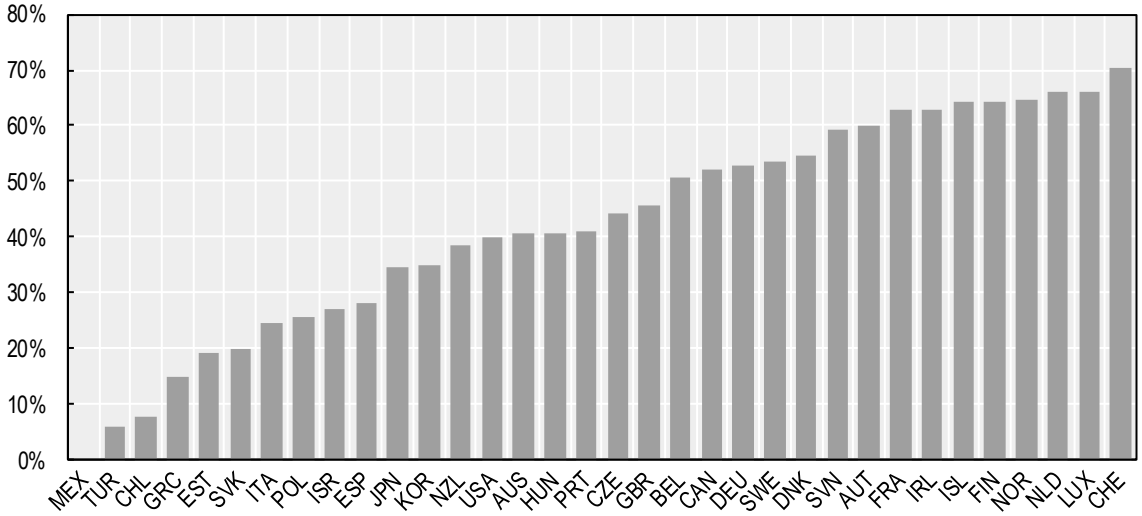
Source: OECD calculations based on the *OECD Tax-Benefit database*.

Effective unemployment insurance

36. Taking the product of coverage rates and replacement rates by benefit category, and adding them up yields the overall rate of effective unemployment insurance. The country averages for 2010 are documented in **Figure 5.** Effective insurance is highest in Luxemburg, the Netherlands and Switzerland, where most workers, due to the combination of relatively high coverage and replacement rates in at least one of the insurance schemes, retain a significant share of their income and living standards even when unemployed. On the other hand, unemployed workers in Chile, Greece, Mexico or Turkey can typically count on very little income support from public sources, mainly as a result of very low coverage rates.

Figure 5. **Effective unemployment insurance in OECD countries**

Percentage of previous net individual earnings averaged across household types, 2010



Note: Calculations for Chile concern information as of 2011.

Source: OECD calculations based on the OECD Social Benefit Recipients database and the OECD Tax-Benefit database.

4.3. Labour market insecurity

37. In the previous sections, we have defined unemployment risk as the expected loss of income due to unemployment in the absence of insurance. Unemployment insurance, on the other hand, was defined as the degree to which income losses due to unemployment are likely absorbed through the tax-and-benefits system. Since the proposed measure of labour market insecurity is intended to capture the expected loss in income due to unemployment after taking account of insurance, it combines the risk and insurance components in the following way:

$$\textit{Labour market insecurity} = \textit{Unemployment risk} * (1 - \textit{Unemployment insurance})$$

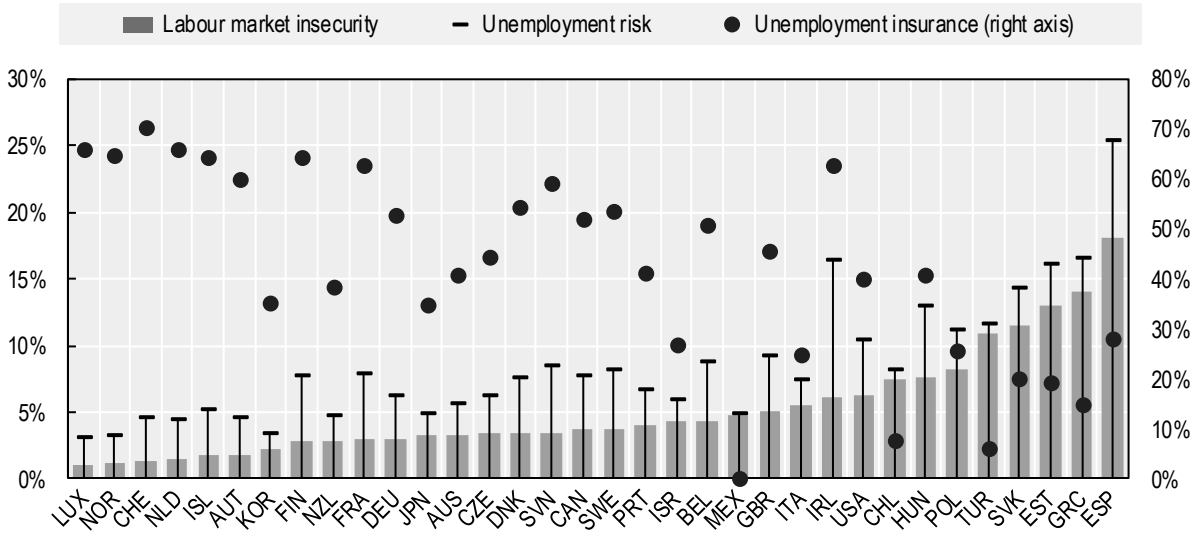
38. It is worth noting that the proposed measure of labour market insecurity does not take account of the relationship between unemployment and insurance at the level of individuals or sub-groups. As long as the effects of risk and insurance are compounded, combining them at the country level can potentially lead to significant biases in the resulting insecurity score.[21] However, our calculations suggest that the practical relevance of this aggregation bias tends to be rather limited: comparisons between top-down country-level and bottom-up group-level constructs reveal that (1) the resulting insecurity scores and rankings are almost identical, and that (2) taking account of the inter-relationships between risk and insurance at the group level tends to leave the level of insecurity at the country level largely unchanged. If anything, allowing for interactions between risk and insurance results in the reduction of the country-level score, which suggests that socio-economic groups with above-average risk exposure within a country are likely to have above-average insurance as well.

21. Moreover, within-country disparities in labour market insecurity are also likely to matter for aggregate welfare and could even provide justification for assuming some level of inequality aversion when constructing an aggregate indicator.

39. **Figure 6** presents the measure of labour market insecurity and its main components across OECD countries as of 2010. The highest levels of labour market insecurity are observed in Estonia, Greece, and Spain, where employed workers can expect to record, on average, a 10-15% reduction in their earnings as a result of unemployment in the near future. At the other end of the spectrum, workers in the Netherlands, Norway and Luxembourg can expect only minimal unemployment-related losses in earnings due to a combination of low risk and high insurance. In fact, the cross-country correlation between the two insecurity components is (weakly) negative, which suggests that the positive within-country relationship between risk and insurance (see previous paragraph) are reversed once country averages are concerned. Therefore, there is an even larger polarization in terms of labour market insecurity across member states that what is observed separately in relation to either unemployment risk or unemployment insurance.

Figure 6. **Labour market insecurity in the OECD**

Share of previous earnings, 2010



Note: Calculations for Chile concern 2011 information.

Source: OECD calculations based on the OECD Employment and Labour Market Statistics database, the OECD Social Benefit Recipients database and the OECD Tax-Benefit database.

5. LABOUR MARKET INSECURITY OVER TIME AND BETWEEN SOCIO-DEMOGRAPHIC GROUPS

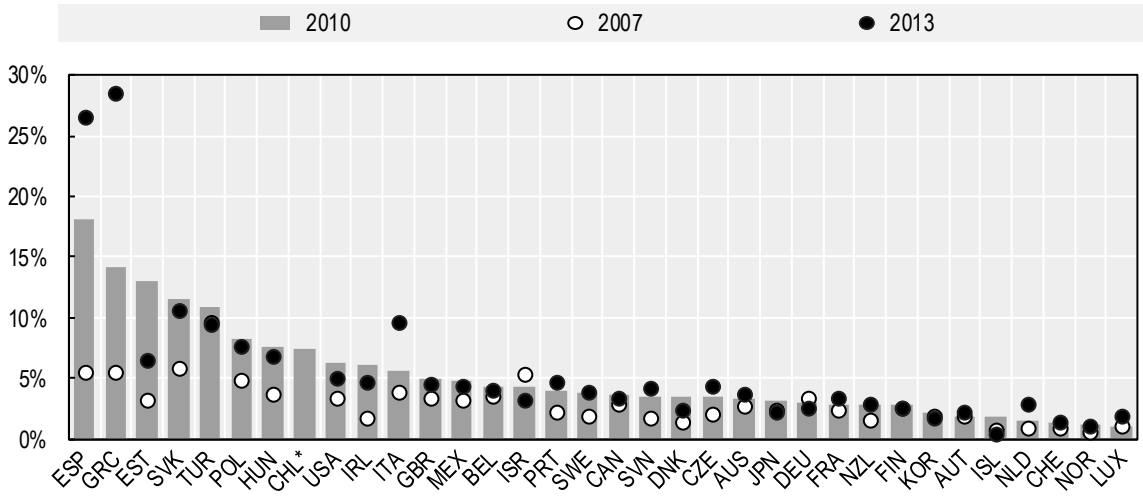
40. Focusing on labour market insecurity and its components at a given point in time at the country level can provide only partial information about the persistence individuals' labour market insecurity over time and their relative dispersion across the workforce. This section is going to review these aspects.

5.1. Labour market insecurity over time

41. Labour market insecurity not only exhibits large differences across countries but is also subject to important changes over time. **Figure 7** documents labour market insecurity for each country in 2007, the latest year before the start of the global financial crisis, 2010, the reference year in the rest of this paper, and 2013, the most recent year for which data is available. It reveals that labour market insecurity has evolved markedly differently across countries: while rising steeply in Greece and Spain, it has remained largely the

same in several other countries and even decreased in a couple of others (such as Germany or Turkey). Interestingly, there is some indication that countries with higher insecurity in 2007 tended not only to score higher also in 2013 (the cross-country correlation coefficient is 62%) but also recorded a higher absolute rise in insecurity (the correlation coefficient is 37%). This suggests that while labour market insecurity is relatively persistent over time, it is also associated with heightened economic vulnerability that can prove very costly in downturns.[22] Figure 7 also reveals that the national labour markets were at very different stages of their economic cycle during the reference period of 2010: while things continued to get worse right until 2013 in countries such as Greece, Italy or Spain, other member states were successful in reducing insecurity by 2013 from its earlier peak levels (e.g. Denmark, Estonia or Iceland).

Figure 7. **Labour market insecurity over time**



Note: Information for Chile is only available for 2011 and is used as figure for 2010.

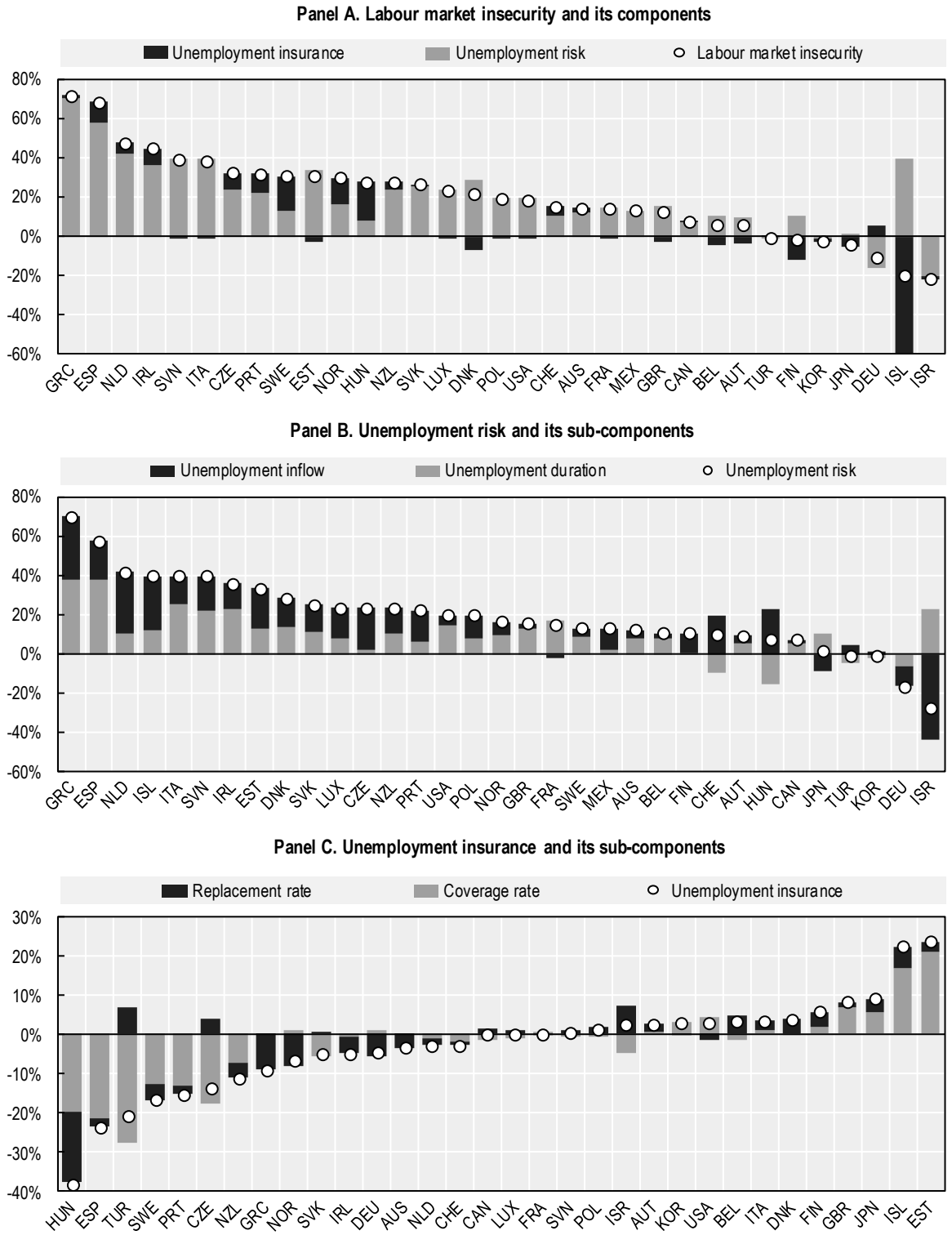
Source: OECD calculations based on the OECD Employment and Labour Market Statistics database, the OECD Social Benefit Recipients database and the OECD Tax-Benefit database.

42. In order to better understand the main drivers of labour market insecurity during the business cycle, it is useful to review how its components and sub-components have changed over time. In particular, the multiplicative nature of the labour market insecurity indicator makes it possible to decompose (proportional) changes in the overall measure into the sum of (proportional) changes in its components. **Figure 8** below shows the result of this decomposition for the period between 2007 and 2013.

43. Panel A decomposes the increase in overall labour market insecurity into the part that can be attributed to the increase in unemployment risk and that due to the reduction in effective insurance. It shows that the rise in labour market insecurity since the start of the global financial was predominantly driven by a rise in the risk of being unemployed. Unemployment insurance also decreased considerably in many countries, thereby contributing to the overall increase in labour market insecurity. Notable exceptions include Finland and Iceland, where increases in unemployment insurance fully offset the rise in unemployment risk. Hungary and Sweden are also remarkable in that the increase in insecurity was driven predominantly by reductions in unemployment insurance in these countries. In Germany, the risk of unemployment declined while unemployment insurance became less effective.

22. This echoes the results found in Chapter 2 of the *OECD Employment Outlook 2012* that labour markets characterised by lower levels of structural unemployment tend to be more resilient.

Figure 8. **Changes in risk and insurance components across countries between 2007 and 2013**



Note: Chile is missing from all panels due to lack of available data. Mexico is missing from Panel C due to the absence of unemployment insurance in the country.

Source: OECD calculations based on the OECD Employment and Labour Market Statistics database, the OECD Social Benefit Recipients database and the OECD Tax-Benefit database.

44. Panel B decomposes the increase in unemployment risk into the part that is due to the increase in the risk of becoming unemployed and that to the rise in the expected average duration of unemployment. It shows that the relative importance of these two components differs markedly from one country to the next. Heightened flows into unemployment were the main culprit behind the increase in unemployment risk in countries such as the Czech Republic, Hungary and Switzerland. Conversely, the increased duration of unemployment spells was the main driver of insecurity in countries such as France, Italy Spain or the United States. Interestingly, job-losing and job-finding rates were moving in the same direction in Hungary, Japan, Switzerland and Turkey, thus partially offsetting their effects on unemployment risk. These results in general are more mixed than the recent findings by Elsby et al. (2013) based on previous crisis episodes, suggesting a prominent role for the duration of unemployment spells as the main driver of unemployment in English-speaking countries, and a more balanced contribution by the unemployment inflow and outflow components in northern and continental Europe. Part of this may be due to the very heterogeneous way OECD countries have been affected by and have responded to the crisis, which can crucially change what adjustments take place in the respective risk domains.

45. Panel C decomposes, by means of a shift-share analysis, the increase in effective insurance into the part that is due to the increase in the coverage rate and that to the rise in the replacement rate of unemployment benefits.[23] It shows that changes in unemployment insurance took place in both directions, even though they were rather limited in around half of the OECD. In countries where unemployment insurance did change markedly, much of the adjustment was driven by the coverage rate of benefits: the share of unemployed with financial assistance increased substantially in countries such as Estonia, Iceland and the United Kingdom, while it shrunk considerably in the Czech Republic, Hungary, Spain and Turkey. Much of these changes are the direct result of newly introduced measures aimed at changing the accessibility and generosity of safety-net benefits, although the changing composition of the pool of unemployed workers probably also had an effect.[24] Replacement rates remained largely unchanged in most countries, even though benefits became more generous in Iceland and Turkey, and less generous in Greece, Hungary and Norway. The combined effect of these changes implies that public insurance for the unemployed was severely reduced in Hungary, Spain or Sweden between 2007 and 2013.

5.2. Labour market insecurity across socio-economic groups

46. Since the workforce in a given country is very heterogeneous, it is equally important to assess how unemployment risk, unemployment insurance and overall labour market insecurity differ across socio-economic groups. The groups that we consider are characterized by:

- gender (male, female),

23. Rather than simply decomposing proportional changes of the relevant indicator into its two sub-components as was done for Panel A and Panel B, decomposition for unemployment insurance involves a so-called shift-share analysis. This method can account for the multiplicity of sub-components and differentiates of the *between* and *within* variation in coverage and replacement rates. More specifically, calculating the partial (average) effect of changing in one component by fixing the other component at its average level across the two period makes it possible to collapse the effect of potentially three different components (for unemployment insurance, unemployment assistance and social assistance, respectively) into a single number.

24. As Chapter 1 of the OECD's *Society at a Glance 2014* shows, countries where the biggest changes in benefit coverage materialised during the period in question invariably introduced policies that influenced the accessibility of social benefits, through reduced duration of unemployment benefit programmes (Hungary, Portugal), tightened eligibility conditions (Czech Republic, Spain) or increased spending on lower-tier assistance (Estonia, Iceland). This suggests that the role of composition effects in driving coverage rates tends to be rather limited.

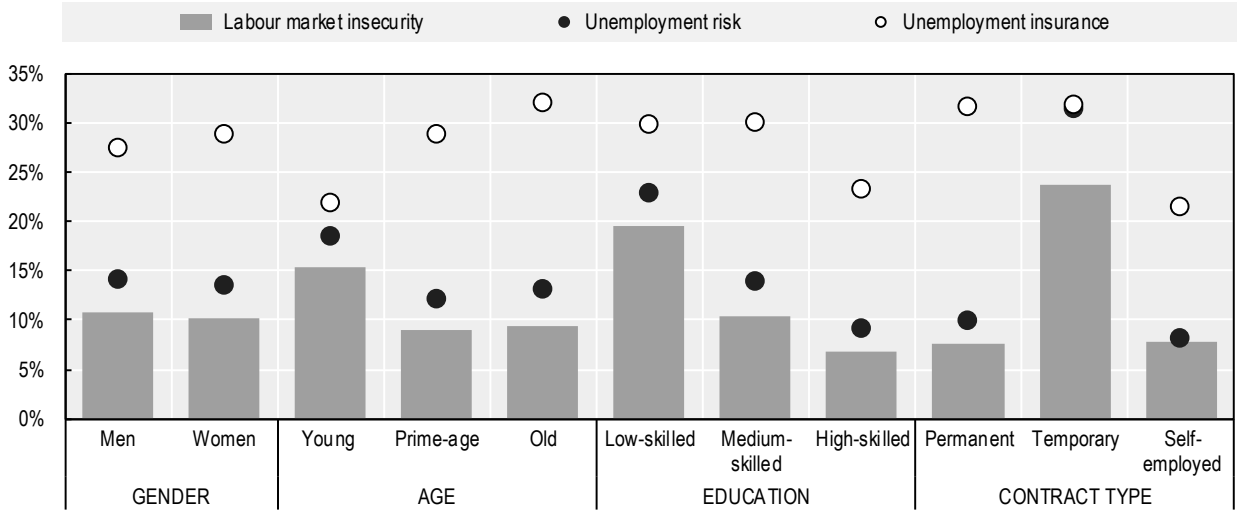
- age (young [15-29], prime-aged [30-49], old [50-64]),
- educational background (low-skilled [lower secondary education or less], medium-skilled [upper secondary education], high-skilled [tertiary education]),
- type of employment contract (permanent employee, temporary employee, self-employed).[25]

47. As detailed in Section 4, micro-level data from national and international surveys were used to replace aggregate sources in some parts of the analysis to construct indicators at the group level. In particular, this concerns the calculation of the coverage rate and replacement rate of unemployment benefits by group. The former is based on observing the share of benefit recipients among the unemployed, while the latter involves calculating the ratio of the groups' average earnings level and the average national earnings in a given year in order to determine the appropriate the net replacement rate to be used.

48. **Figure 9** shows cross-country averages of labour market insecurity and its components across socio-economic groups, and reveals substantial differences within the workforce. Labour market insecurity is highest among the young, the low-skilled and workers on a temporary contract, while the high-skilled and workers on a permanent contract are the most insulated from labour market risks. The size of these differences is rather large, implying that lacking skills or having a temporary job *alone* can increase one's labour market insecurity several times relative to their (high-skilled or permanently employed) peers. Interestingly, gender does not play a significant role when it comes to labour market insecurity, even though men tend to have both slightly higher unemployment risk and slightly lower unemployment insurance than women. It is also remarkable that older workers do only marginally worse than prime-aged workers and fare significantly better than youth on average (see Chapter 1 of *OECD Employment Outlook 2013* for more discussion). **Figure 9** also shows that variation in labour market insecurity across socio-economic groups is driven principally by unemployment risk, while differences in unemployment insurance are much less pronounced. The insurance rate is lowest among youth due to their low coverage rate, the effect of which is only partially offset by the relatively generous replacement income received by those eligible for benefits.

25. While the classification of individuals in the sample along the lines of gender, age and education is straightforward, some explanation is required in the case of the type of employment contract. The main issue lies with the need to know the type of employment contract not only of those currently employed, but also those unemployed. For the latter, the type of employment contract concerns that of the last job prior to unemployment. In many surveys, this information is available either through direct questions related to the characteristics of individuals' previous employment, or the (main) reason why their last job was terminated.

Figure 9. **Labour market insecurity and its components by socio-economic group**



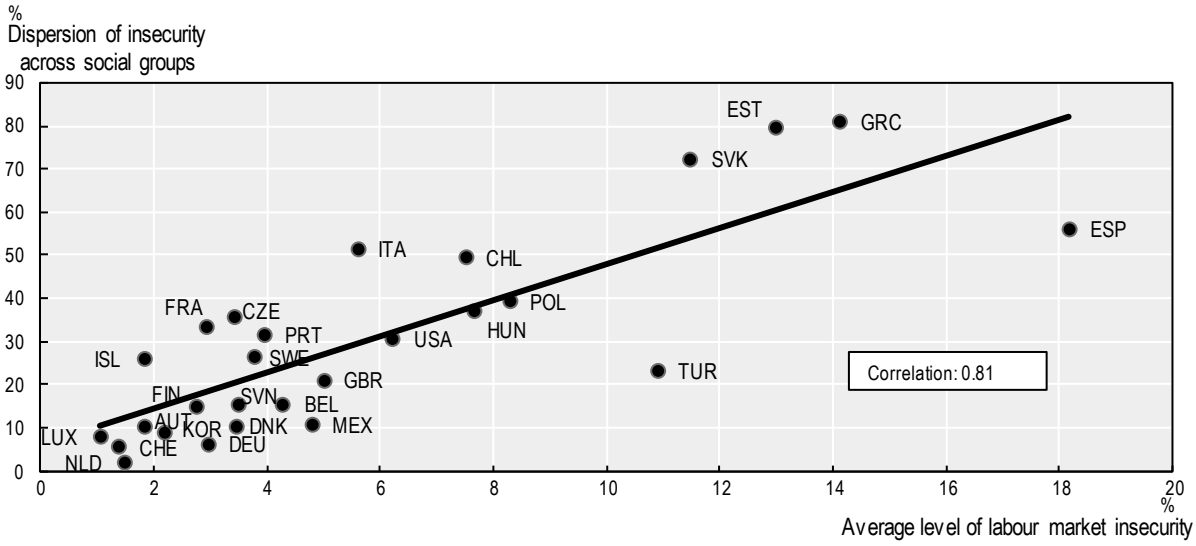
Note: Calculations are based on 2010 data except for Switzerland (2011) and Turkey (2011). Figures represent simple cross-country averages across all OECD countries except Canada, Chile, Ireland, Israel, Japan, New Zealand and Norway. Unemployment insurance accounts for unemployment benefits only and does not contain social assistance transfers. (See Section 4 for more details regarding the construction of the unemployment insurance measure).

Source: OECD calculations based on national and international labour force surveys (EU-LFS and EU-SILC for member states of the European Union, HILDA for Australia, Canadian LFS, CASEN for Chile, GSOEP for Germany, Israeli LFS, KHPS for Japan, KLIPS for Korea, ENOE and ENIGH for Mexico, SAKE for Switzerland, Turkish LFS and the EU-SILC national file for Turkey, CPS for USA). For the calculation of unemployment insurance, the *OECD Social Benefit Recipients database*, the *OECD Employment and Labour Market Statistics database* and the OECD *Tax-Benefit database* were also used.

49. **Figure 10** compares the dispersion of labour market insecurity across socio-economic groups to the average level of labour market insecurity in a country. Dispersion is measured by the difference, in percentage points, between the most and least insecure groups in a country. The figure reveals that countries with relatively high overall insecurity tend to display larger disparities across socio-economic groups.[26] This seems to suggest that labour market insecurity in a country is, to a large extent, dominated by the performance of the most disadvantaged groups. It also suggests that differences in terms of labour market insecurity across countries are rather subdued among the most secure groups (e.g. older *highskilled* workers). This implies that low overall insecurity in a country presupposes a certain degree of equality across the workforce, as well as an appropriate alignment between the risk and insurance profiles of respective socio-economic groups.

26. Note that the extremely high range estimates imply extremely high unemployment risk estimates. This should by no means be interpreted as the level of unemployment being this high in the most disadvantaged groups. The reason being that the close correspondence between unemployment risk and the unemployment rate only prevails if the inflow rate is much smaller than the outflow rate, and breaks down once this relationship does not hold (as in the case of the most disadvantaged socio-economic groups).

Figure 10. **The relationship the average level of labour market insecurity in a country and its dispersion across socio-economic groups**



Note: Calculations are based on 2010 data except for Switzerland (2011) and Turkey (2011). Australia, Canada, Chile, Ireland, Israel, Japan, New Zealand and Norway are missing due to missing data for some or all socio-economic groups. Labour market insecurity was calculated by the measure of unemployment insurance that contains unemployment benefits only. The dispersion of insecurity across social groups in a country is measured by the difference, in percentage points, between the most and least insecure groups.

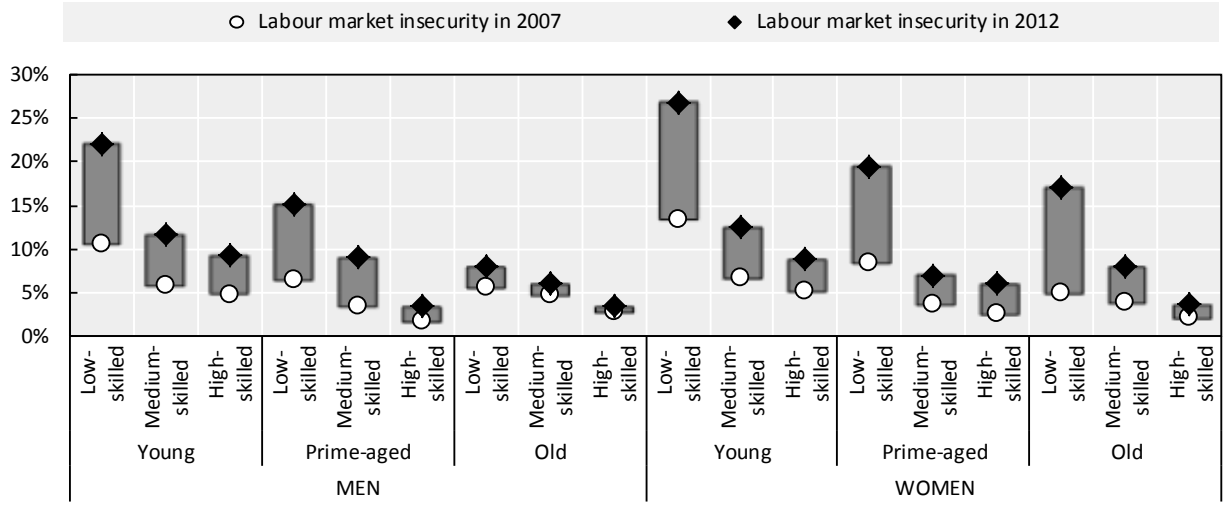
Source: OECD calculations based on national and international labour force surveys (EU-LFS and EU-SILC for member states of the European Union, HILDA for Australia, Canadian LFS, CASEN for Chile, GSOEP for Germany, Israeli LFS, KHPS for Japan, KLIPS for Korea, ENOE and ENIGH for Mexico, SAKE for Switzerland, Turkish LFS and the EU-SILC national file for Turkey, CPS for USA). For the calculation of unemployment insurance, the *OECD Social Benefit Recipients database*, the *OECD Employment and Labour Market Statistics database* and the OECD *Tax-Benefit database* were also used.

50. It is also interesting to see how labour market insecurity changed in the wake of the financial crisis across the workforce. **Figure 11** below shows its evolution between 2007 and 2012 for each worker group defined by gender, age and education on a cross-country basis.[27] It reveals that, across the OECD in general, the recent economic crisis did not have a significant impact on the relative ranking between groups: the most and least vulnerable groups have generally been the same both before and after the crisis. However, the degree by which labour market risks among workers increased in the period shows a great disparity: while the insecurity of low-educated workers doubled or even tripled in most cohorts, high-skilled workers only experienced a modest increase of a couple of percentage points only on average. As discussed previously, older workers were also more successful in maintaining their risk position on the labour market. It is less widely acknowledged, however, that this seems to apply primarily to men: older women – particularly those without tertiary education – have become much more insecure on the labour market than their male counterparts during the crisis.[28]

27. The choice of 2012 (instead of 2013) as the end period reflects the latest year for which the group-level statistics are available for most OECD countries.

28. Understanding the main reasons behind this divergence is beyond the scope of this paper. However, it may be related to recent labour market reforms and government intervention being more likely to benefit male workers. (See Chapter 19 of OECD (2012) for further discussion.) Alternatively, it is also possible that the underlying assumption (of no individual transitions between employment and inactivity) for calculating

Figure 11. **Change in labour market insecurity by worker group between 2007 and 2012**



Note: Calculations are based on 2010 data except for Switzerland (2011) and Turkey (2011). Australia, Canada, Chile, Ireland, Israel, Japan, New Zealand and Norway are missing due to missing data for some or all socio-economic groups. Labour market insecurity was calculated by the measure of unemployment insurance that contains unemployment benefits only.

Source: OECD calculations based on national and international labour force surveys (EU-LFS and EU-SILC for member states of the European Union, HILDA for Australia, Canadian LFS, CASEN for Chile, GSOEP for Germany, Israeli LFS, KHPS for Japan, KLIPS for Korea, ENOE and ENIGH for Mexico, SAKE for Switzerland, Turkish LFS and the EU-SILC national file for Turkey, CPS for USA). For the calculation of unemployment insurance, the *OECD Social Benefit Recipients database*, the *OECD Employment and Labour Market Statistics database* and the OECD *Tax-Benefit database* were also used.

6. THE STATISTICAL RELATIONSHIP BETWEEN LABOUR MARKET INSECURITY AND SUBJECTIVE WELL-BEING

51. There is considerable empirical evidence that unemployment risk and insurance have important consequences for workers' subjective well-being. Much of this literature is devoted to studying the implications of unemployment risk on reported life satisfaction or happiness. These studies typically approximate the risk of unemployment by the actual unemployment rate, without differentiating between risk components (i.e. the probability of becoming unemployed and the expected duration of unemployment). For example, Helliwell and Huang (2011) find that each percentage point increase in the unemployment rate has the equivalent well-being effect of a 3% reduction in household income among the employed in Canada. They suggest that this indirect well-being effect of unemployment even exceeds its direct effect among the unemployed (e.g. Clark, 2003) due to the much larger number of individuals concerned. Boarini et al. (2014) and OECD (2014) find somewhat similar results using data for 32 OECD countries from the Gallup World Poll.

52. Studies that extend the well-being analysis to also include unemployment insurance, such as Di Tella et al. (2003) and Sjöberg (2010), find that higher unemployment benefits are associated with higher reported well-being among both the employed and the unemployed. These results indicate that

unemployment risk is less appropriate for older women due to their increased likelihood of dropping out of the labour force in crisis periods.

unemployment benefits may be viewed as a collective resource with important benefits to society over and above those to the unemployed who directly utilize them. In fact, Young (2012) finds that unemployment insurance eligibility offsets very little of the adverse well-being effects of unemployment once individual workers are considered, which may suggest that unemployment insurance is unable to absorb the substantial non-pecuniary costs of unemployment. Nevertheless, the observed inefficiency of unemployment benefits in reducing the well-being gap between the employed and the unemployed is puzzling, and may be related to differences in the nature of unemployment across countries. In fact, Aghion et al. (2015) claim that, even at a given level of unemployment, the speed of the Schumpeterian creative destruction process – as measured by job or unemployment turnover – can be very different from one place to another, and that it is positively related to subjective well-being in the US.

53. This section provides a cursory but systematic investigation of the empirical relationship between labour market insecurity and subjective well-being. The richness of the proposed concept of labour market insecurity allows for improving our understanding of the channels through which labour market risks translate into lower well-being. Our analysis has the following novel features:

- It takes a *cross-country perspective* and covers the whole of the OECD. While this approach poses additional difficulties in terms of data availability and data comparability, it nevertheless makes it possible to exploit considerable variation in unemployment risk and insurance across countries.
- Since the concept of unemployment risk is defined on the basis of individuals' transitions in and out of unemployment rather than the unemployment rate, this approach may allow for a more refined way of measuring the well-being consequences of unemployment risk. Specifically, a qualitative difference in the well-being effects of job-finding and job-loss may suggest that workers are concerned not only about the level of unemployment but also its nature.
- Besides accounting for the stand-alone effect of unemployment insurance on the well-being gap, our analysis focuses principally on the interaction of insurance with the risk of unemployment. This is important as the usefulness of unemployment insurance from a well-being perspective may depend on the specific set of risk patterns discussed above.

54. To study the relationship between labour market insecurity and subjective well-being, we build a semi-aggregated dataset where each observation represents a specific worker group defined along the same dimensions as for the group-level comparisons in Section 5.[29] The dataset was compiled from national and international household and labour force surveys (see Annex 1 for specific details). It contains the group-level measures of unemployment risk and unemployment insurance as defined in Section 4, and covers virtually all OECD countries between 2006 and 2012 on an annual basis.[30]

55. Group-level figures for labour market insecurity and its sub-components were calculated following the methodology outlined in Section 4. Nevertheless, the calculation of unemployment insurance at the group level involves two important caveats. First, in the absence of survey data on social assistance recipiency, the concept of unemployment insurance used in the statistical analysis concerns only unemployment benefits (UI and UA). Moreover, since no distinction is made between UI and UA in terms

29. This involves classifying individuals based on their gender, age, education, as well as employment status. The type of employment contract was also considered as a potential basis for classification, but the number of underlying observations was so not high enough for certain types (e.g. temporary employees or self-employed) so that cell-level inference be reliable on a consistent basis.

30. New Zealand is missing from the database entirely due to our lack of access to labour force survey information. Canada and Israel are absent due to missing information on coverage rates and earnings, respectively. Data for Chile, Ireland, Mexico, Norway, Switzerland and Turkey are not available for all years.

benefit recipiency in the micro data, the country-specific relative shares of these (as calculated from the OECD Social Benefit Recipiency database) were used to break up observed coverage rates into UI and UA within groups. Second, the net replacement rates associated with UI and UA were calculated using the earnings position of each group relative to the national average in a given country and year.[31]

56. Information on subjective well-being comes from two different micro-level sources. The primary data source is the Gallup World Poll which contains information on individuals' self-reported life satisfaction on an annual basis for all OECD countries. Data on subjective well-being from the European Social Survey (ESS) is used an additional source. While the ESS covers European countries and is available on a bi-annual basis only, its rich characterization of subjective well-being makes it a valuable source of information. It includes a wide range of qualitative questions referring to individuals' subjective assessment of their life satisfaction, job satisfaction and job security. [32] The ESS is therefore used to check the robustness of the baseline results using the Gallup data and to get an indication of the role of psychological channels through which labour market insecurity may influence well-being.

57. The resulting semi-aggregated dataset used for the analysis thus comprises both objective and subjective information. Since all data sources used are representative and sample the same underlying population in a given country and year, the fact that potentially different individuals are surveyed for various parts of the analysis should not matter from a statistical standpoint.[33]

6.1 Stylized relationship between labour market insecurity and well-being

58. The empirical analysis starts by looking at the stylized relationship between (objective) labour market insecurity and (subjective) well-being among employed workers. **Figure 12** below focuses on the cross-country dimension. Panel A displays a strong negative relationship between labour market insecurity and average reported life satisfaction across the OECD in 2010 using the Gallup data. Importantly, this relationship is robust to using data from the ESS, to choosing a different reference year, or to featuring alternative subjective well-being proxies such as job satisfaction or job security. Panel B takes a dynamic perspective and compares the evolution of labour market insecurity and average subjective well-being between 2007 and 2013 across countries. It shows that reported life satisfaction is much lower, relative to

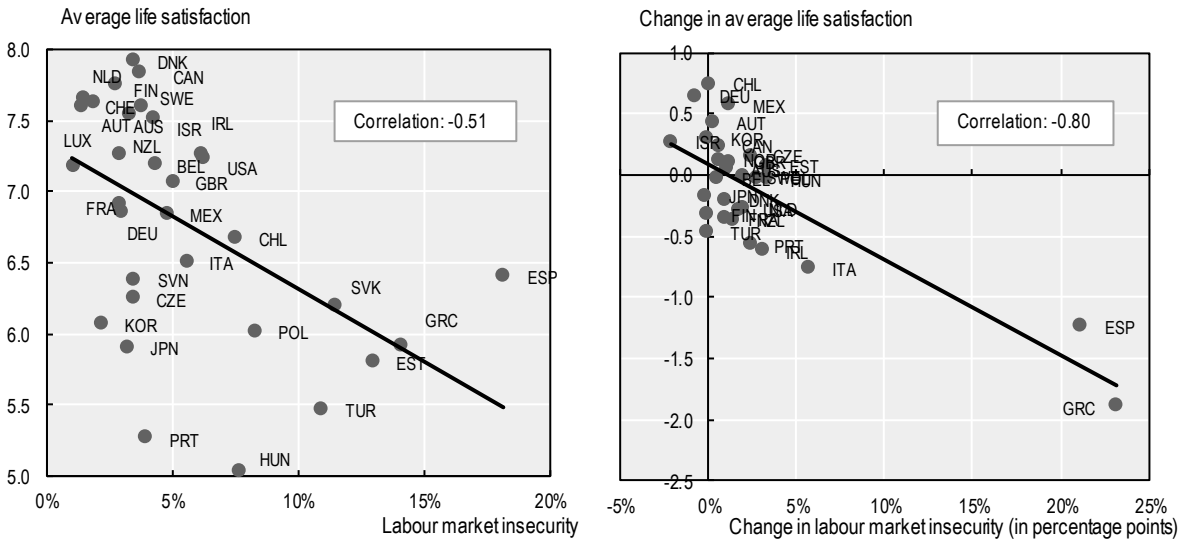
31. In order to maintain consistency with the method used for calculations on the aggregate level, both 100% and 67% of the relative earnings position (expressed in terms of the national average) of each group were considered when determining the eventual net replacement rate. For example, if average earnings among the employed in a given worker group was equal to 120% of the national average, the replacement rate calculations were carried out using both the 120% and 80% (120*0.67) earnings levels.

32. Individuals' subjective life satisfaction is evaluated on a 0-10 ordinal scale in the Gallup World Poll, with higher values indicating more favourable outcomes. As far as the ESS is concerned, the same scale is used for measuring individuals' life satisfaction and job satisfaction. Questions related to perceived job security are found in the ad-hoc module called "Family, work and well-being" and featured in the 2010 wave. They refer to the perception of having a secure job (on a scale of 1-4), the perception of finding a similar job easily (on a scale of 0-10) as well as the importance attached to work security (on a scale of 1-5).

33. A somewhat more technical issue concerns differences in the robustness of group-level statistics in the cross-section and across datasets. To limit its potential impact on our results, we use the weighted least squares estimator and use only those cells in the regression for which the relevant group-level statistics involve at least 10 underlying individual observations. A related issue concerns the availability of a wide range of potential weighting schemes, each of which are associated with a particular aspect of the calculations or the data. To limit the arbitrariness of this choice, we use the same set of weights associated with all active individuals in a given socio-economic group in the relevant labour force survey throughout the regression analysis.

its 2007 value, in countries that experienced large hikes in labour market insecurity in the wake of the crisis such as Greece, Italy or Spain.[34]

Figure 12. **Relationship between labour market insecurity and subjective well-being across countries**



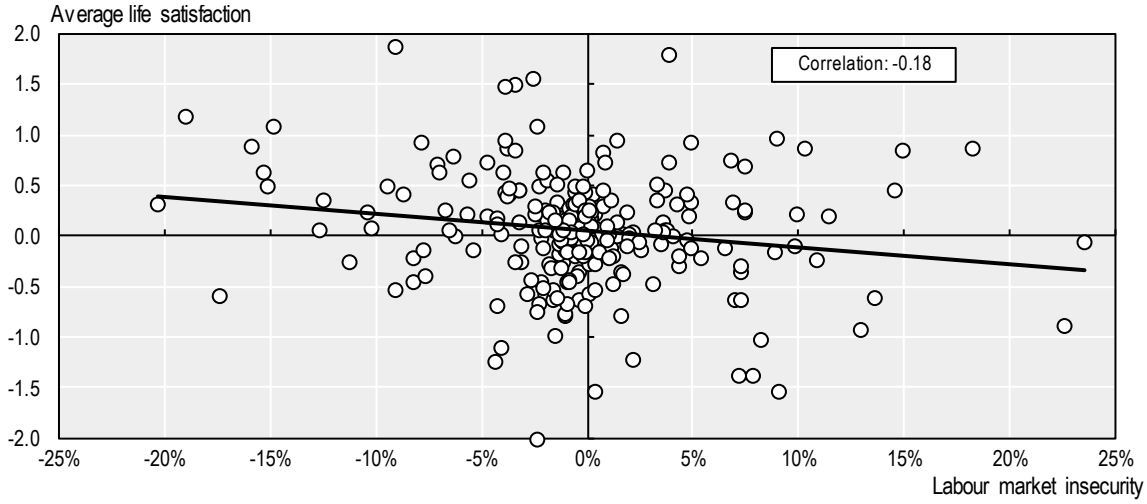
Note: Due to missing data on self-reported life satisfaction, Iceland and Norway are missing from Panel A while Iceland, Luxembourg, the Slovak Republic, Slovenia and Switzerland are missing from Panel B. The figures on Panel A are based on 2011 data on life satisfaction for Estonia and 2009 data on life satisfaction for Switzerland. On Panel B, for some countries, changes in life satisfaction are considered between 2008-2013 (Austria, Canada, Finland, France, Ireland, Italy, Mexico, the Netherlands, Portugal, Spain, Sweden, Turkey), between 2007-2012 (Chile, Israel, Korea, United States) and 2008-2012 (Norway) due to missing information.

Source: OECD calculations based on the OECD Employment and Labour Market Statistics database, the OECD Social Benefit Recipients database and the OECD Tax-Benefit database and the Gallup World Poll.

59. Comparing the performance of socio-economic groups in a given country reveals a similar pattern. **Figure 13** plots, for each socio-economic group in 2010, the deviations in labour market insecurity and reported life satisfaction from their respective country averages. It shows that the dispersion of well-being scores within countries can be as high as between them: some groups report life satisfaction scores that are above or below the respective country average by a number as high as two – the equivalent of the distance between the most positive Scandinavian workers and the relatively dissatisfied Estonian or Turkish ones. **Figure 13** also suggests that labour market insecurity, among other potential factors, may indeed be an important driver of subjective well-being in a country.

34. The relationship also holds if these three countries (Greece, Italy and Spain) are treated as outliers and are excluded from the calculations. Moreover, this result is robust to using different periods, data sources and well-being proxies also.

Figure 13. **Relationship between labour market insecurity and subjective well-being within countries**



Note: Calculations are based on 2010 data. Labour market insecurity was calculated by the measure of unemployment insurance that contains unemployment benefits only. Data points for each socio-demographic group represent deviations from the respective country average.

Source: OECD calculations based on national and international labour force surveys (EU-LFS and EU-SILC for member states of the European Union, HILDA for Australia, Canadian LFS, CASEN for Chile, GSOEP for Germany, Israeli LFS, KHPS for Japan, KLIPS for Korea, ENOE and ENIGH for Mexico, SAKE for Switzerland, Turkish LFS and the EU-SILC national file for Turkey, CPS for USA). For the calculation of unemployment insurance, the *OECD Social Benefit Recipients database*, the *OECD Employment and Labour Market Statistics database* and the OECD *Tax-Benefit database* were also used. Reported life satisfaction scores are derived from the Gallup World Poll.

6.2 Regression analysis and results

60. Our main analysis concerning the role of unemployment risk and insurance for subjective well-being is based on the following baseline regression model:

$$WELL-BEING_{ijt} = \alpha_1 RISK_{ijt} + \alpha_2 INSURANCE_{ijt} + \alpha_3 RISK_{ijt} * INSURANCE_{ijt} +$$

$$+\alpha_4 EARNINGS_{ijt} + \mu_i + \mu_j + \mu_t + \varepsilon_{ijt},$$

where subscripts refers to worker group (as defined by gender, age, education) *i* in country *j* in year *t*. The dependent variable WELL-BEING stands for a (normalized) score of a particular measure of subjective well-being, while the right-hand side features measures of unemployment RISK and unemployment INSURANCE as well as the level of average EARNINGS as a control variable. Importantly, the model also contains an interaction term between RISK and INSURANCE that captures the potentially variable compensating effect of insurance against risk. ε_{ijt} represents a random disturbance term, while μ_i , μ_j, μ_t denote group fixed-effects, country fixed-effects and year fixed-effects, respectively. Alternative specifications involving other fixed-effect combinations as well as a further breakdown of the risk and insurance components are also considered. All regression specifications are estimated with the weighted least squares estimator using the labour force shares of each socio-demographic group in a country as weights.

61. **Table 1** present the baseline estimates using reported life satisfaction from the Gallup World Poll as the dependent variable. Three different control environments were considered: the first features dummy variables by socio-economic category, the second applies a fixed-effect for each of the 18 possible gender-age-education combinations considered, while the third features a separate fixed-effect for each socio-economic group in each country. Moreover, country and year dummies are also used in all specifications to further remove systematic variation in subjective well-being that is unrelated to labour market insecurity.[35] Columns 1-3 show the reduced-form estimates and indicate that the negative relationship between labour market insecurity and life satisfaction is indeed robust in a statistically significant way. The magnitude of the estimates also suggest that this effect is qualitatively important: a 10 percentage point increase in labour market insecurity is associated with a 3-5% of a standard deviation decrease in life satisfaction. Importantly, this effect is roughly equivalent to that of a 10% reduction in individual earnings.

62. Columns 4-6 in **Table 1** decompose labour market insecurity in order to measure the statistical associations between its components and reported life satisfaction. Using the same control environment as before, we find that the well-being effects of labour market insecurity are driven mostly by unemployment risk: the relevant estimates are all negative, strongly significant and even larger in absolute magnitude than the reduced-form estimates on labour market insecurity. The parameter estimates for unemployment insurance also tend to be negative in statistically significant way in most specifications. Paradoxically, this would suggest that higher unemployment insurance corresponds to lower well-being. This is a puzzling finding, which may nevertheless be reasonable to the extent that more protective regulation leads to longer unemployment spells or that the costs of insurance are borne by the employed themselves (Clark and Postel-Vinay, 2009).[36] Concerning the interaction term between unemployment risk and unemployment insurance, our estimates in the baseline specifications are all positive which corresponds to (partially) offsetting the negative well-being consequences of unemployment risk (or unemployment insurance). However, they lack the statistical significance that would attest to the interdependence of the impact of risk and insurance on well-being.

63. The channels through which labour market insecurity may influence workers' individual well-being can be numerous and may not necessarily be related to perceptions of insecurity on the labour market. For example, it is very likely that higher unemployment translates into increased job strain for existing workers, or that current workers are also emotionally or financially involved in the misfortune of those who lost their jobs. Similarly, the effect of increased unemployment insurance might be purely financial by raising the expected stream of future revenue and providing income stability for the employed. To improve our understanding of what drives the statistical relationship between labour market insecurity and subjective well-being, it is useful to exploit the rich information on job satisfaction, job security and work preferences in the ESS. This can help assess the nature and importance of psychological factors associated with labour market insecurity that influence well-being outcomes.

35. Note that, to the extent that differences in reported life satisfaction across countries and over time are driven by labour market insecurity, featuring the aforementioned controls may lead to the underestimation of the true impact of labour market insecurity on well-being.

36. The similar negative relationship between life satisfaction and the level of employment protection has been found by a number of studies (Postel-Vinay and Saint-Martin, 2005; Wasmer, 2006; Salvatori, 2010). The findings by Clark and Postel-Vinay (2009) are in line with this, even though they find a positive association between the generosity of unemployment insurance benefits (as measured by the net replacement rate alone) on a small sample of European countries.

Table 1. **Baseline estimation results**

Regression of the standardized score of life satisfaction on unemployment risk and insurance components

	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Labour market insecurity	-0.376**	-0.411**	-0.551***			
	(0.174)	(0.172)	(0.182)			
Unemployment risk				-0.565**	-0.677**	-0.864***
				(0.285)	(0.281)	(0.320)
Unemployment insurance				-0.340**	-0.327**	-0.269
				(0.162)	(0.161)	(0.177)
Unemployment risk * Unemployment insurance				0.559	0.903	0.704
				(0.630)	(0.620)	(0.725)
Earnings (in logs)	0.415***	0.362***	0.824***	0.416***	0.361***	0.834***
	(0.085)	(0.085)	(0.212)	(0.085)	(0.086)	(0.212)
Socio-demographic controls	Yes	No	No	Yes	No	No
Group fixed-effects	No	Yes	No	No	Yes	No
Group & Country fixed-effects	No	No	Yes	No	No	Yes
Country fixed-effects	Yes	Yes	No	Yes	Yes	No
Year fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,192	1,192	1,192	1,192	1,192	1,192
R-squared	0.823	0.826	0.887	0.823	0.827	0.887

Note: The point estimates in the table denote the change (in standard deviations) of reported life satisfaction associated with the maximum increase from zero to 100 percent in transition probabilities and unemployment insurance.

Specifications with socio-demographic controls include separate dummies for each sex, age and education category. Specifications with group-fixed effects involve a separate dummy for each of the 18 different sex-age-education groups considered in the analysis. Specifications with group & country fixed-effects contain a dummy for each different group in each country. Beside these, each specification contains separate county and year fixed-effects (except for those with group & country fixed-effects which only contain additional year fixed-effects).

The underlying dataset contains annual observations from all OECD countries except for Canada, Israel, Norway and New Zealand for the 2006-2012 period. Only those observations are included in the regression where the group-level statistics are based on at least 10 individual observations for all variables considered. Estimates were obtained using the weighted least squares estimator based on labour force survey weights among the active population. *,**,*** denote statistical significance at 10%, 5% and 1% significance levels, respectively.

Source: Estimates on reported life satisfaction come from the Gallup World Poll. Concerning data sources on labour market insecurity and its components, see notes to Figure 13 or Annex 1.

64. **Table 2** presents the result of the baseline model for five different dependent variables, using the control specification with group fixed-effects. Column 1 replicates the previous analysis (based on Gallup data) and documents very similar results. Column 2 features job satisfaction as the dependent variable, and finds that it is not statistically related to labour market insecurity or its components. This may suggest that increased work demands or insufficient work resources are unlikely to be the main channels through which labour market insecurity influences well-being among the employed. Results in Columns 3 to 5 are based on a single cross-section of data from the year of 2010, and are therefore even more tentative. Using the perception of having a secure job as the dependent variable (Column 3) nevertheless yields statistically significant parameter estimates for all independent variables (most notably on the interaction between unemployment risk and insurance), and implies a far stronger response in well-being than in the baseline

scenarios. Similar point estimates are derived when the importance attached to job security is used as the subjective dependent variable, although they are statistically less significant (Column 5). The parameter estimates associated with the likelihood of finding a similar job easily are not revealing (Column 4), which may point to the instability of our estimates but may also suggest that, once dismissed, most workers are not that preoccupied with finding a similar job as before. Altogether, these results tend to suggest that increased anxiety over job security may be at the heart of why increased labour market insecurity leads to lower reported life satisfaction.

Table 2. **Estimation results associated with different subjective measures of well-being and job security**

Regression of the standardized score of different measures of subjective well-being on unemployment risk and insurance components

	LIFE SATISFACTION	JOB SATISFACTION	JOB SECURITY - "Having a secure job"	JOB SECURITY - "Likelihood of finding a similar job easily"	ASPECTS OF WORK - "Importance of job security"
Unemployment risk	-0.458**	-0.461*	-1.165***	0.260	-0.701*
	(0.200)	(0.262)	(0.401)	(0.330)	(0.415)
Unemployment insurance	-0.365**	0.377	-0.748*	0.291	-0.634
	(0.185)	(0.341)	(0.405)	(0.430)	(0.700)
Unemployment risk * Unemployment Insurance	0.791	0.894	2.209**	-1.078	2.066**
	(0.509)	(0.588)	(0.956)	(0.814)	(0.892)
Earnings (in logs)	0.637***	0.541***	0.413**	0.292	-0.232
	(0.107)	(0.159)	(0.189)	(0.185)	(0.233)
Observations	809	615	249	249	249
R-squared	0.846	0.562	0.864	0.831	0.807

Note: The point estimates in the table denote the change (in standard deviations) of reported life satisfaction associated with the maximum increase from zero to 100 percent in unemployment risk and unemployment insurance. Estimates are based on the specification with group-fixed effects that involve a separate dummy for each of the 18 different sex-age-education groups considered in the analysis. Beside these, county and year fixed-effects are also considered.

The underlying dataset contains annual observations from 18 European OECD countries (BEL, CZE, DNK, EST, FIN, FRA, DEU, GRC, HUN, ISL, NLD, POL, PRT, SVK, SVN, ESP, SWE, CHE) for the years 2006, 2008, 2010 and 2012. Only those observations are included in the regression where the group-level statistics is based on at least 10 individual observations for all variables considered. Estimates were obtained using the weighted least squares estimator (based on labour force survey weights among the active population) on the control specification involving group fixed-effects. *,**,*** denote statistical significance at 10%, 5% and 1% significance levels, respectively.

Source: Estimates on various measures of subjective well-being come from the European Social Survey. Concerning data sources on labour market insecurity and its components, see notes to Figure 13 or Annex 1.

65. In light of our previous findings, it is useful to replicate the analysis by decomposing unemployment risk into its sub-components, the unemployment inflow and outflow probabilities. The main advantage of this specification is that it allows us to assess whether other aspects of unemployment beyond its size are likely to matter for well-being or not. More specifically, even at the same level of unemployment, the frequency and duration of unemployment spells may influence the well-being costs associated with them, especially if the cross-effects with unemployment insurance are also accounted for. **Table 3** presents the regression results associated with these more elaborate specifications using both data sources and various econometric specifications. Several interesting patterns stand out:

Table 3. **Estimation results based on the flow-based approach to unemployment risk**

Regression of the standardized score of life satisfaction on unemployment risk and insurance components

	Estimates based on Gallup data				Estimates based on ESS data			
	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8
Unemployment inflow probability	-3.189**	-3.616**	-4.659**	-7.120***	-2.849	-2.642	-5.722*	-6.296**
	(1.368)	(1.425)	(2.361)	(2.574)	(1.848)	(1.896)	(3.023)	(2.972)
Unemployment outflow probability	0.630**	0.675**	0.347	0.500	0.743*	0.767*	1.773**	1.783**
	(0.297)	(0.300)	(0.612)	(0.617)	(0.397)	(0.405)	(0.701)	(0.700)
Unemployment insurance			-0.268	-0.244			-0.001	-0.028
			(0.236)	(0.237)			(0.252)	(0.256)
Unemp. inflow * Unemp. insurance			4.189	10.65**			9.974	12.39*
			(4.998)	(5.319)			(6.903)	(6.761)
Unemp. outflow * Unemp. insurance			-0.392	-0.530			-3.391**	-3.387**
			(1.523)	(1.550)			(1.482)	(1.480)
Earnings (in logs)	0.392***	0.377***	0.432***	0.377***	0.605***	0.615***	0.625***	0.640***
	(0.073)	(0.073)	(0.088)	(0.088)	(0.104)	(0.105)	(0.105)	(0.107)
Socio-demographic controls	Yes	No	Yes	No	Yes	No	Yes	No
Group fixed-effects	No	Yes	No	Yes	No	Yes	No	Yes
Observations	1,422	1,422	1,192	1,192	815	815	809	809
R-squared	0.824	0.826	0.821	0.825	0.841	0.845	0.843	0.847

Note: The point estimates in the table denote the change (in standard deviations) of reported life satisfaction associated with the maximum increase from zero to 100 percent in transition probabilities and unemployment insurance.

Specifications with socio-demographic controls include separate dummies for each sex, age and education category. Specifications with group-fixed effects involve a separate dummy for each of the 18 different sex-age-education groups considered in the analysis. Beside these, each specification contains separate county and year fixed-effects.

The underlying dataset, data filtering technique and estimation methodology are the same as used described in the notes to Table 1 for the Gallup data and the notes to Table 2 for the ESS data. *,**,*** denote statistical significance at 10%, 5% and 1% significance levels, respectively.

Source: Estimates on reported life satisfaction come from the Gallup World Poll and the European Social Survey (ESS). Concerning data sources on labour market insecurity and its components, see notes to Figure 13 and Annex 1.

- *Both unemployment inflow and outflow probabilities matter for subjective well-being.* Across all specifications and both data sources, estimates for the unemployment inflow probability are consistently negative while estimates for unemployment outflow probability are consistently positive and are statistically significant in most cases. Each percentage point increase in the unemployment inflow probability is associated with a decrease of 2.6-7.1% of a standard deviation in life satisfaction, while the same increase in the unemployment outflow probability increases life satisfaction by 0.3-1.8% of a standard deviation on average.[37] This suggests that employed workers are concerned not only about becoming unemployed, but also about not being able to find employment afterwards.

37. Note that a one percentage point change in either the unemployment inflow probability or the unemployment outflow probability does not generally represent the same relative adjustment, which implies that their respective effect on unemployment risk tends to be very different.

- *Higher unemployment turnover increases well-being.* It is worth noting that even at the same level of unemployment, the predicted well-being response may vary depending on the frequency and duration of unemployment spells. To see this, consider a hypothetical "high-turnover" scenario characterized by a relatively high monthly inflow probability of 5% and average unemployment duration of 2 months with a hypothetical "low-turnover" case marked by a low unemployment inflow rate of 2% and average unemployment duration of 5 months, respectively. While both scenarios correspond to an unemployment rate of around 10 percent, the high well-being costs associated with long-term unemployment imply that the "high-turnover" case corresponds to around 10% of a standard deviation higher life satisfaction. Interestingly, this may help rationalize the negative associations found between the degree of employment protection and subjective well-being, since employment protection tends to increase the duration of unemployment with little impact on the overall level of unemployment.

- *The role of unemployment insurance may depend on the nature of labour market risks.* The break-down of unemployment risk into its components also reveals that the effectiveness of unemployment insurance in mitigating the well-being costs of insecurity likely depends on the nature of unemployment. First, parameter estimates for the stand-alone effect of unemployment insurance are not significantly different from zero once the interaction terms by risk component are introduced. Second, the estimated coefficients for the interaction term with unemployment inflows are all positive while those for the interaction term with unemployment outflows are all negative, in a statistically significant way in half of the specifications. This suggests that, for a given profile of unemployment risk, an increase in unemployment insurance may effectively reduce the well-being costs associated with both higher unemployment inflows and longer unemployment spell (that is, lower unemployment outflows). The magnitudes of our estimates imply that an effective unemployment insurance rate of 50% may eliminate the bulk of the additional well-being costs associated with a given increase in unemployment among the employed.[38]

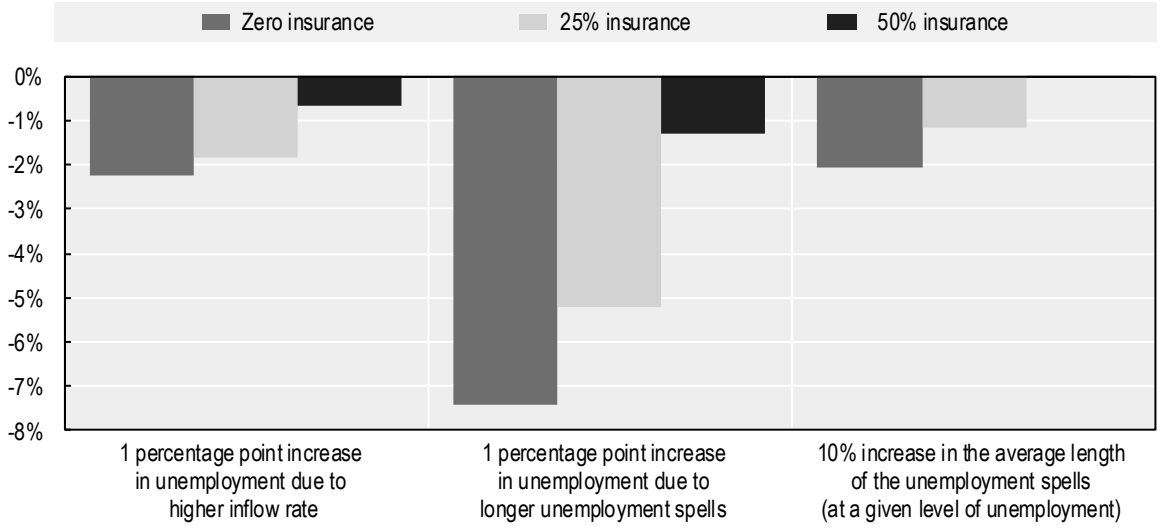
66. A succinct way of presenting how marginal changes in unemployment risk and insurance are expected to influence well-being is provided in **Figure 14**. It shows predicted differences in well-being associated with different risk and insurance profiles, as derived from the combination of parameter estimates presented in **Table 3**. In particular, it illustrates that an increase in unemployment brought about by the lengthening of unemployment spells may have a larger negative effect on worker well-being than an equivalent rise in unemployment caused by an increase in the inflow probability.[39] **Figure 14** also reveals that longer unemployment spells, at any given level of unemployment, may provoke welfare losses equivalent to those caused by a comparable relative increase in the rate of joblessness. Furthermore, it documents that unemployment insurance may eliminate the bulk of the welfare loss associated with unemployment by significantly reducing the sensitivity of well-being to changes in risk characteristics.

38. To see this, one needs to consider a realistic labour market environment characterized by a specific set of parameters for the unemployment inflow and outflow probabilities as well as the rate of unemployment insurance, and calculate the predicted change in standardized life satisfaction using the coefficient estimates in Table 3.

39. Note that while coefficient estimates for the unemployment outflow probability are much smaller in magnitude than those for the inflow probability, absolute (percentage point) changes in the latter are often an order of magnitude smaller than in the former. This explains the stronger predicted well-being response to changes in the unemployment outflow probability (rather than the inflow probability), both in the presence and absence of unemployment insurance.

Figure 14. **Predicted well-being effects of unemployment risk and insurance**

Change in standardized life satisfaction



Note: Figures are based on coefficient estimates in Table 3, whereby the simple average of each coefficient across all relevant specifications was used for robustness reasons. On the vertical axis, the predicted change (in standard deviations) of reported life satisfaction is measured. The predicted well-being effects correspond to a hypothetical baseline scenario characterized by an unemployment rate of 10% and monthly unemployment inflow and outflow probabilities of 5% and 50%, respectively.

Source: Estimates on reported life satisfaction come from the Gallup World Poll and the European Social Survey (ESS). Concerning data sources on labour market insecurity and its components, see notes to Figure 13 and Annex 1.

7. CONCLUDING REMARKS AND POLICY IMPLICATIONS

67. This paper provides a comprehensive discussion of the labour market security dimension of the OECD's job quality framework. As such, it complements the analysis in Chapter 3 of the *OECD Employment Outlook 2014* and Chapter 5 of the *OECD Employment Outlook 2015*. Its contributions are threefold. First, it provides an in-depth discussion of the definition and measurement of labour market security. Second, it provides a statistical portrait of labour market security across countries, socio-economic groups and over time. Lastly, it investigates the statistical relationship between labour market insecurity and subjective measures of well-being.

68. Our analysis of the statistical relationship between labour market insecurity and well-being confirms that labour market insecurity has strong negative consequences for employed workers' life satisfaction and perceived labour market prospects. Importantly, this implies reducing unemployment does not just benefit those currently out of work, but also increases the welfare of employed workers by reducing the risk of unemployment. This provides a further argument for putting the fight against high and persistent unemployment on the top of the policymakers' agenda.

69. This paper also presents evidence that the well-being implications of unemployment are likely to depend not only on the unemployment rate but also on the frequency and duration of unemployment spells. In particular, we find that, at a given level of unemployment, a higher number of relatively short unemployment spells is preferable, from a welfare point of view, to a lower number of relatively long unemployment spells. This suggests that policies aimed at raising the outflow rate and improving access to

good quality jobs (such as active labour market policies, work-to-work schemes, training programs) may have higher pay-offs in terms of well-being than policies seeking to contain the risk of job loss in the first place (such as employment protection legislation). Since discouraging job destruction may at the same time hamper job creation, policymakers should continually be reminded that a reasonable chance for a prompt re-employment after job loss may well be the best protection a worker can have.

70. Moreover, this is the first paper to document the importance of interactions between unemployment risk and unemployment insurance for the subjective well-being of employed workers. While it seems that the adverse well-being effects of labour market insecurity among the employed can be considerably mitigated by unemployment insurance under all circumstances, our results also suggest, in line with our intuition, that the effectiveness of unemployment insurance is likely to be the highest when unemployment turnover is low and unemployment spells are long. In this respect, the challenge for policymakers is to increase the share of unemployed that receive some form of income assistance, and to fine-tune the replacement rates of benefits so as to effectively alleviate the financial distress among most unemployed workers without reducing their job search efforts and training intensity.

REFERENCES

Aghion P., U. Akcigit, A. Deaton and A. Roulet (2015), "Creative Destruction and Subjective Wellbeing", *NBER Working Paper No.21069*, National Bureau of Economic Research, Inc., Cambridge, United States.

Ahn H. J. and J. D. Hamilton (2014), "Heterogeneity and Unemployment Dynamics", unpublished paper

Anderson, C.J. and J. Pontusson (2007), "Workers, Worries and Welfare States: Social Protection and Job Insecurity in 15 OECD Countries", *European Journal of Political Research, Vol.* 46, pp. 211-235.

Bargain, O., H. Immervoll and H. Viitamaki (2010), "No Claim, No Pain: Measuring the Non-Take-up of Social Assistance Using Register Data", *IZA Discussion Paper No 5355.*

Benito, A. (2004), "Does Job Insecurity Affect Household Consumption?", *Bank of England Working Papers*, No. 220, Bank of England

Boarini, R., J. Cordoba, F. Murtin and M. Ripoll (2015, forthcoming), "Beyond GDP: Is There a Law of One Shadow Price?", *OECD Statistics Working Papers*, OECD Publishing, Paris, forthcoming.

Campbell, D., A. Carruth, A. Dickerson and F. Green (2007), "Job Insecurity and Wages", *Economic Journal*, Vol. 117, No. 518, pp. 544-566.

Cazes, S., A. Hijzen and A. Saint Martin (2015), "Measuring and Assessing Job Quality: The OECD Job Quality Framework", *OECD Social, Employment and Migration Working Papers* (forthcoming).

Chetty, R. (2008), "Moral Hazard versus Liquidity and Optimal Unemployment Insurance", *Journal of Political Economy*, Vol. 116, No. 2, pp. 173-234.

Clark, A.E. (2003), "Unemployment as a Social Norm: Psychological Evidence from Panel Data", *Journal of Labor Economics*, Vol. 21, No. 2, pp. 289-322.

Clark, A.E. and A.J. Oswald (1994), "Unhappiness and Unemployment", *Economic Journal*, Vol. 104, No. 424, pp. 648-59, May.

Clark, A.E., P. Frijters and M. A. Shields (2008), "Relative Income, Happiness, and Utility: An Explanation for the Easterlin Paradox and Other Puzzles", *Journal of Economic Literature*, Vol. 46, No. 1, pp. 95-144.

Clark, A.E. and F. Postel-Vinay (2009), "Job Security and Job Protection", *Oxford Economic Papers*, Vol. 61, No. 2, pp. 207-239.

Cooper, D. (2013), "The Effect of Unemployment Duration on Future Earnings and Other Outcomes", *FRBB Working Papers* No.13-8, Federal Reserve Bank of Boston.

Couch, K. A. and D. W. Placzek (2010), "Earnings Losses of Displaced Workers Revisited", *American Economic Review*, Vol. 100(1), pp. 572-589.

De Cuyper, N., J. De Jong, H. De Witte, K. Isaksson, T. Rigotti and R. Schalk (2008), "Literature Review of Theory and Research on the Psychological Impact of Temporary Employment: Towards a Conceptual Model", *International Journal of Management Reviews*, Vol. 10, pp. 25-51.

Dickerson, A. and F. Green (2012), "Fears and Realisations of Employment Insecurity", *Labour Economics*, Vol. 19, No. 2, pp. 198-210.

Di Tella, R., R.J. MacCulloch and A.J. Oswald (2003), "The Macroeconomics of Happiness", *Review of Economics and Statistics*, Vol. 85; No. 4, pp. 809-827.

Elsby, M., R. Michaels and G. Solon (2009), "The Ins and Outs of Cyclical Unemployment", *American Economic Journal: Macroeconomics*, Vol. 1, No. 1, pp. 84-110.

Eurofound (2012a), *Trends in Job Quality in Europe*, Publications Office of the European Union, Luxembourg.

Eurofound (2012b), *Health and Well-being at Work: A Report Based on the Fifth European Working Conditions Survey*, Dublin.

Eurofound (2012c), *Fifth European Working Conditions Survey*, Publications Office of the European Union, Luxembourg.

Eurofound (2007), *Fourth European Working Conditions Survey*, Publications Office of the European Union, Luxembourg.

Fujita, S. and G. Moscarini (2013), "Recall and Unemployment", *NBER Working Paper No. 19640*, National Bureau of Economic Research, Inc., Cambridge, United States.

Fujita, S. and G. Ramey (2009), "The cyclicality of separation and job finding rates", *International Economic Review*, Vol. 50 (2), pp. 415-430.

Green, F. (2011), "Unpacking the Misery Multiplier: How Employability Modifies the Impacts of Unemployment and Job Insecurity on Life Satisfaction and Mental Health", *Journal of Health Economics*, Vol. 30, No. 2, pp. 265-276.

Green, F. (2009), "Subjective Employment Insecurity Around the World", *Cambridge Journal of Regions, Economy and Society*, Vol. 2, No. 3, pp. 343-363.

Helliwell, J.F and H. Huang (2011), "New Measures of the Costs of Unemployment: Evidence from the Subjective Well-being of 3.3 Million Americans", *NBER Working Papers No. 16829*, National Bureau of Economic Research, Inc., Cambridge, United States.

Hernanz, V., F. Malherbet and M. Pellizzari (2004), "Take-Up of Welfare Benefits in OECD Countries", *OECD Social, Employment and Migration Working Papers*, No. 17, OECD Publishing

Hijzen, A., R. Upward and P. W. Wright (2010), "The Income Losses of Displaced Workers", *Journal of Human Resources*, Vol. 45, No. 1, University of Wisconsin Press.

Jacobson, L.S. and R.J. LaLonde and D.G. Sullivan (1993), "Earnings Losses of Displaced Workers", *American Economic Review*, Vol. 83, No. 4, pp. 685-709.

Kroft, K., F. Lange, M. Notowidigdo and L. Katz (2014), "Long-Term Unemployment and the Great Recession: The Role of Composition, Duration Dependence, and Non-Participation", *The Journal of Labor Economics*, forthcoming.

Kuhn, P.J. (2002), "Summary and Synthesis", in P.J. Kuhn (ed.), *Losing Work, Moving on International Perspectives on Worker Displacement*, W. E. Upjohn Institute for Employment Research, Kalamazoo, Michigan, United States.

Lüchinger, S., S. Meier and A. Stutzer (2010), "Why Does Unemployment Hurt the Employed? Evidence from the Life Satisfaction Gap between the Public and the Private Sector", *Journal of Human Resources*, Vol. 45, No. 4, pp. 998-1045.

Lusardi, A. (1998), "On the Importance of the Precautionary Saving Motive", *American Economic Review*, Vol. 88, No. 2, pp. 449-453.

Machin, S. and A. Manning (1999), "The causes and consequences of longterm unemployment in Europe", in O. Ashenfelter and D. Card (ed.), *Handbook of Labor Economics*, Ed. 1, Vol. 3, Chapter 47, pp. 3085-3139, Elsevier.

Manski, C.F. and J.D. Straub (2000), "Worker Perceptions of Job Insecurity in the Mid-1990s: Evidence from the Survey of Economic Expectations", *Journal of Human Resources*, Vol. 35, No. 3, University of Wisconsin Press, pp. 447-479.

Matsaganis, M., A. Paulus and H. Sutherland (2008), "The take up of social benefits", Research Note No. 5, European Observatory on the Social Situation and Demography, European Commission.

Nekarda, C. J. (2009): Understanding Unemployment Dynamics: The Role of Time Aggregation, mimeo (available at http://chrisnekarda.com/papers/time-aggregation.pdf).

Nolan, J.P., I.C. Wichert and B.J. Burchell (2000), "Job Insecurity, Psychological Well-being and Family Life", in E. Heery and J. Salmon (eds.), *The Insecure Workforce*. Routledge, London.

Nordenmark, M. (1999), "Non-Financial Employment Motivation and Well-Being in different Labour Market Situations: A Longitudinal Study", *Work, Employment & Society*, Vol. 13, No. 4, pp.601-620.

Nordenmark, M. and M. Strandh (1999), "Towards a Sociological Understanding of Mental Well-Being among the Unemployed: The Role of Economic and Psychological Factors", *Sociology*, Vol. 33, No. 3, pp. 577-597.

Nordmeier, D. (2014), "Worker flows in Germany: Inspecting the time aggregation bias", *Labour Economics*, Vol. 28, pp. 70-83

OECD (2014), "Towards a Multi-dimensional Framework for Inclusive Growth", *Inclusive Growth*, OECD Publishing, Paris, forthcoming.

OECD (2013), *How's Life?* Measuring Well-being, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264201392-en.

OECD (2012), *Closing the Gender Gap: Act Now*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264179370-en

OECD (2011a), *Society at a Glance 2011: OECD Social Indicators*, OECD Publishing, Paris, http://dx.doi.org/10.1787/soc_glance-2011-en

OECD (2011b), *OECD Employment Outlook 2011*, OECD Publishing, Paris, http://dx.doi.org/10.1787/empl_outlook-2011-en.

OECD (2007), *Benefits and Wages: OECD indicators*, OECD Publishing, Paris, http://dx.doi.org/10.1787/ben_wages-2007-en.

OECD (2006), *OECD Employment Outlook 2006*, OECD Publishing, Paris

OECD (1997), *OECD Employment Outlook 1997*, OECD Publishing, Paris.

Postel-Vinay, F. and A. Saint-Martin (2005), "How Do Employees Perceive Employment Protection?", *Economie et Statistique*, Vol. 372, Institut National de la Statistique et des Etudes Economiques, pp. 41-59.

Salvatori, A. (2010), "Labour Contract Regulations and Workers' Wellbeing: International Longitudinal Evidence," *Labour Economics*, Vol. 17, No. 4, Elsevier, pp. 667-678, August.

Shimer, R. (2012), "Reassessing the Ins and Outs of Unemployment", *Review of Economic Dynamics*, Vol. 15, No. 2, pp. 127-148.

Sjöberg, O. (2010), "Social Insurance as a Collective Resource: Unemployment Benefits, Job Insecurity and Subjective Well-being in a Comparative Perspective", *Social Forces*, Vol. 88, No. 3, pp. 1281-1304.

Stephens, M. Jr. (2004), "Job Loss Expectations, Realizations, and Household Consumption Behavior", *Review of Economics and Statistics*, Vol. 86, No. 1, pp. 253-269.

Stiglitz, J., A. Sen and J.-P. Fitoussi (2009), "Report by the Commission on the Measurement of Economic Performance and Social Progress", www.stiglitz-sen-fitoussi.fr/documents/rapport_anglais.pdf.

Venn, D. (2012), "Eligibility Criteria for Unemployment Benefits: Quantitative Indicators for OECD and EU Countries", *OECD Social, Employment and Migration Working Papers*, No. 131, OECD Publishing

Wasmer, E. (2006), "The Economics of Prozac: Do Employees Really Gain from Strong Employment Protection?", *IZA Discussion Papers*, No. 2460, Bonn.

Wichert, I. (2002), "Job Insecurity and Work Intensification: The Effects on Health and Well-being", in B. Burchell, D. Ladipo and F. Wilkinson (eds.), *Job Insecurity and Work Intensification*, Routledge, London.

Winkelmann, L. and R. Winkelmann (1998), "Why Are the Unemployed So Unhappy? Evidence from Panel Data", Vol. 65, No. 257, pp. 1-15.

Young, C. (2012), "Losing a Job: The Non-pecuniary Cost of Unemployment in the United States", *Social Forces*, Vol. 91, No. 2, pp. 609-634.

ANNEX 1 – DATA SOURCES USED

The empirical analysis in this paper makes use a wide array of information sources.

At the country-level, the OECD's official databases were used, in particular:

- the *OECD Unemployment Duration Database and the OECD Employment Database* for the calculation of unemployment risk;
- the *OECD Labour Market Programmes Database* and the *OECD Benefit Recipients Database* for the calculation of the coverage rate of unemployment insurance;
- the *OECD Taxes and Benefits Database* for the calculation of the replacement rate of unemployment insurance.

For group-level comparisons and analytical purposes, a different set of micro-level sources were used to extend (e.g. as in the case of labour force shares), replace (e.g. as in the case of unemployment risk) and complement (as in the case of the coverage rate and replacement rate of unemployment insurance). The data sources used for each OECD country and area of analysis are listed in the table below:

Countries	Unemployment risk	Coverage rate of unemployment insurance	Relative earnings (for replacement rate of unemployment insurance)	Labur force shares (used as weights in the analysis)
AUS	Household, Income and Labour Dynamics in Australia (HILDA)	Household, Income and Labour Dynamics in Australia (HILDA)	Household, Income and Labour Dynamics in Australia (HILDA)	Household, Income and Labour Dynamics in Australia (HILDA)
AUT	EU LFS	EU LFS	EU-SILC	EU LFS
BEL	EU LFS	EU LFS	EU-SILC	EU LFS
CAN	Canadian Labour Force Survey	-	Canadian Labour Force Survey	Canadian Labour Force Survey
CHL	Encuesta de Caracterización Socioeconómica Nacional (CASEN)	Encuesta de Caracterización Socioeconómica Nacional (CASEN)	Encuesta de Caracterización Socioeconómica Nacional (CASEN)	Encuesta de Caracterización Socioeconómica Nacional (CASEN)
CZE	EU LFS	EU LFS	EU-SILC	EU LFS
DNK	EU LFS	EU LFS	EU-SILC	EU LFS
EST	EU LFS	EU LFS	EU-SILC	EU LFS
FIN	EU LFS	EU LFS	EU-SILC	EU LFS
FRA	EU LFS	EU LFS	EU-SILC	EU LFS
DEU	EU LFS	EU LFS	SOEP	EU LFS
GRC	EU LFS	EU LFS	EU-SILC	EU LFS
HUN	EU LFS	EU LFS	EU-SILC	EU LFS
IRL	EU LFS	EU LFS	EU-SILC	EU LFS
ISL	EU LFS	EU LFS	EU-SILC	EU LFS
ISR	Israeli LFS	Israeli LFS	-	Israeli LFS
ITA	EU LFS	EU LFS	EU-SILC	EU LFS
JPN	Keio Household Panel Survey (KHPS)	Keio Household Panel Survey (KHPS)	Keio Household Panel Survey (KHPS)	Keio Household Panel Survey (KHPS)
KOR	Korean Labor and Income Panel Study (KLIPS)	Korean Labor and Income Panel Study (KLIPS)	Korean Labor and Income Panel Study (KLIPS)	Korean Labor and Income Panel Study (KLIPS)
LUX	EU LFS	EU LFS	EU-SILC	EU LFS
MEX	Encuesta Nacional de Ocupación y Empleo (ENOE)	Encuesta Nacional de Ingresos y Gastos de los Hogares (ENIGH)	Encuesta Nacional de Ocupación y Empleo (ENOE)	Encuesta Nacional de Ocupación y Empleo (ENOE)
NLD	EU LFS	EU LFS	EU-SILC	EU LFS
NZL	-	-	-	-
NOR	EU LFS	EU LFS	EU-SILC	EU LFS
POL	EU LFS	EU LFS	EU-SILC	EU LFS
PRT	EU LFS	EU LFS	EU-SILC	EU LFS
SVK	EU LFS	EU LFS	EU-SILC	EU LFS
SVN	EU LFS	EU LFS	EU-SILC	EU LFS
ESP	EU LFS	EU LFS	EU-SILC	EU LFS
SWE	EU LFS	EU LFS	EU-SILC	EU LFS
CHE	EU LFS	EU LFS	SAKE	EU LFS
TUR	Turkish Household Labour Force Survey	EU-SILC national file	EU-SILC national file	Turkish Household Labour Force Survey
GBR	EU LFS	EU LFS	EU-SILC	EU LFS
USA	Current Population Survey	Current Population Survey	Current Population Survey	Current Population Survey

ANNEX 2 – LABOUR MARKET INSECURITY IN EMERGING ECONOMIES

Due to the particular features of labour markets in less developed countries, the concept of labour market insecurity proposed in this paper needs to be revised to remain relevant in the context of emerging economies. While becoming and staying unemployed is the most significant risk for a worker within the OECD, this is not necessarily the case in emerging economies: unemployment is often very low as the absence or weakness of social insurance schemes makes it unaffordable for a considerable share of workers. Instead, many rely on jobs of "last resort" characterized by very low or unstable earnings and only marginally preferable to unemployment. This is why Chapter 5 of the *OECD Employment Outlook 2015* developed a supplementary dimension of labour market insecurity – the risk of being employed in jobs of extreme low-pay. These two distinct concepts – insecurity due to the risk of unemployment and insecurity due to the risk of extreme low-pay – can be considered as dimensions of a more general framework of labour market insecurity: while only the first of them is relevant for OECD countries (as the risk of extreme low-pay is practically zero), both aspects are equally pertinent in less developed economies.

Insecurity from the risk of unemployment is measured in the same way in emerging economies as for OECD countries, except that only micro-level sources are used for the calculations. This implies that survey information on benefit recipiency was used to estimate the coverage rate and replacement rate of unemployment insurance in emerging economies, which is different from the approach taken in relation to OECD countries. Despite important heterogeneity across the sampled countries in terms of the generosity and comprehensiveness of social security systems, national labour force surveys perform well in identifying the workings of the main benefit schemes available to the unemployed. The coverage rate of unemployment insurance is calculated as the share of unemployed receiving either type of benefits, while the (net) replacement rate is defined as the ratio between the average net income of the unemployed benefit recipients and the median (net) earnings among the employed. Therefore, the way unemployment insurance is calculated follows the approach used for OECD countries as closely as possible.[40]

Insecurity from extreme low-pay represents the risk of a worker being employed for very low pay. The relevant low-pay threshold is fixed and corresponds to net hourly earnings of 1 PPP-adjusted US dollar. Low-pay status defined in this way translates to a disposable per capita income of less than 2 PPP-adjusted US dollars per day in a typical household, and suggests absolute material deprivation for those concerned. This is a departure from the relative-deprivation approach commonly adopted in OECD studies, but is more appropriate in this context: focusing on an *absolute* threshold provides a common benchmark for all countries and has the advantage of clearly distinguishing the labour market security dimension of job quality from its other dimensions (e.g. earnings quality).

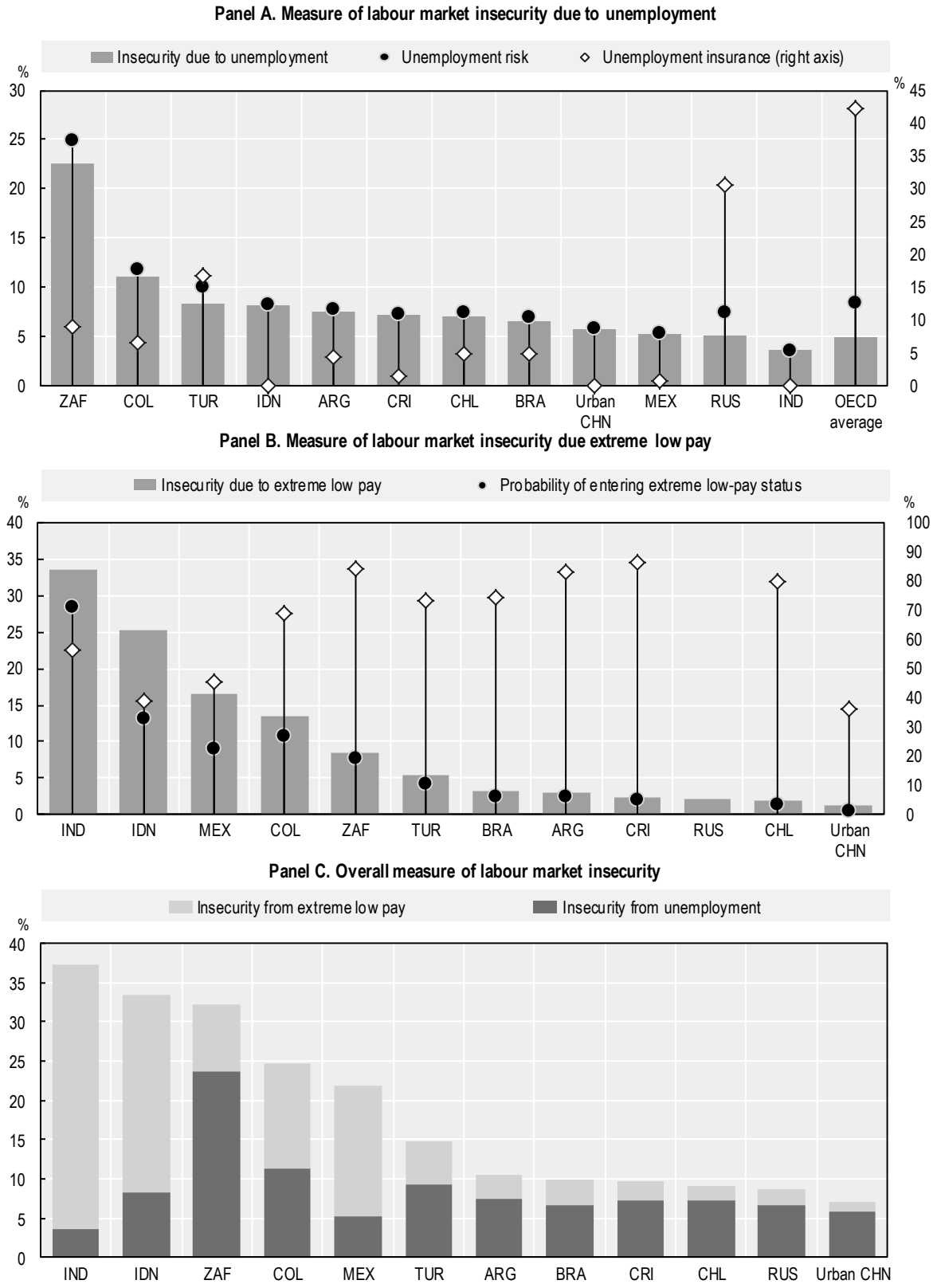
Importantly, due to the lack of available panel datasets where the earnings of the same individuals could be observed over multiple periods, the calculation of insecurity from extreme low-pay relies on a novel methodology proposed by Dang and Lanjouw (2013) to estimate transition probabilities using repeated representative cross-sections. The procedure amounts to determining the persistence of individual earnings

[40] Main methodological differences concern (1) calculating a single coverage rate and replacement rate without breaking them down by benefit type (UI, UA, SA) due to the dominance of social assistance transfers (and the diminished role of unemployment benefit), (2) the inclusion of severance pay in the calculation of unemployment insurance, due to the latter's greater importance relative to unemployment benefits in emerging economies (see Chapter 2 of the *OECD Employment Outlook 2011* for further details), (3) defining the replacement rate in relation to net earnings (instead of gross earnings) due to data limitations and calculating it relative to the median (instead of the mean) earnings among the employed in order to give preference to below-average earners (as in the case of OECD by way of using two different earnings levels). For a more comprehensive discussion of the relevant methodology, see Chapter 5 of OECD Employment Outlook 2015.

based on the behaviour of cohort averages over time, which makes it possible to calculate the joint probability, for each worker type, of being in (or out of) low-pay status over two consecutive periods. With this information, one can produce an estimate of the probabilities of falling into and climbing out of low-paid employment from one period to the next – the combination of which determines the overall risk of extreme low pay. The average incidence of low-pay in a given population can be interpreted as the average share of time a person in that population can reasonably expect to spend in low-paying jobs.

The following figures show the country-level results for labour market insecurity in selected emerging economies. For a more comprehensive discussion, see Chapter 5 of the *OECD Employment Outlook 2015*.

Figure A1. **Labour market insecurity in selected emerging economies**



Note for Panel A: The risk of unemployment was approximated by the unemployment rate due to data limitations. The OECD average is a simple cross-country average of labour market insecurity as presented in Figure 6. Calculations are based on 2010 data, except for Brazil (2011), Chile (2011), China (2009) and Turkey (2011). The data for China, India and Indonesia do not contain transfers, so an insurance rate of 0% is assumed. For Russia, individual replacement rates were backed out from household-level replacement rates based on the assumption that all earners in a household have the same earnings.

Note for Panel B: The low-pay threshold is set at USD PPP 1. The probability of entering and exiting low-pay status are calculated by the pseudo-panel methodology proposed by Dang and Lanjouw (2013) using the sample of employed individuals. The measure of insecurity due to extreme low pay is calculated by (the scaled transformation) of the probability of entering low-pay status times the inverse of the exit probability. Calculations are based on 2009-2010 data, except for Brazil (2009-2011), Chile (2009-2011), China (2008-2009), Costa Rica (2010-2012), India (2011-2012), Mexico (2010-2012), Russia (2010-2012), South Africa (2010-2012) and Turkey (2011-2012). The data for China, India and Indonesia do not contain transfers, so an insurance rate of 0% is assumed. The figure for Russia represents the share of employed working-age individuals living in households with a monthly disposable income of less than RUB 6000, which corresponds to an hourly low-pay threshold of USD PPP 1.14 (as of 2010) for a member of a two-earner family working full-time.

Note for Panel C: Overall labour market insecurity is calculated as insecurity from unemployment plus the insecurity from extreme low pay if employed.

Source: OECD calculations based on national household and labour force surveys (EPH:Argentina, PNAD: Brazil, CASEN: Chile, UHS: China, GEIH: Colombia, ENHAO: Costa Rica, NSS: India, SAKERNAS: Indonesia, ENIGH: Mexico, NIDS: South Africa), the EU-SILC national files (Turkey) and the European Social Survey (Russia).