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Fears and realisations of employment insecurity

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Abstract:

We investigate the validity of subjective data on expectations of job loss and on the probability of re-employment consequent on job loss, by examining associations between expectations and realisations. We find that subjective expectations data reveal private information about subsequent realisations of both job loss and of subsequent re-employment. As predictors of subsequent job loss, the expectations data perform better with numerical descriptors than with ordinal verbal descriptors. On average, employees overestimate the chance of losing their job; while they underestimate the difficulty of finding another job as good as the currently-held one. We recommend that survey items on employment insecurity should be explicit about each risk under investigation, and utilise a cardinal probability scale with discrete numerical descriptors.

Key words: C81, D84, J01, J6

JEL: job insecurity, expectations, employability

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FEARS AND REALISATIONS OF EMPLOYMENT INSECURITY

1. Introduction

Direct subjective indicators of economic expectations are increasingly finding favour within economics as valuable tools for predicting well-being and future behaviour (Manski, 2004). While it is recognised that subjective data have to be used with care in economic analysis, earlier studies have examined and supported the validity of subjective expectations data in various domains (Hurd and McGarry, 2002; Smith et al., 2001; Hamermesh, 1985; Dominitz, 1998; Manski, 2004). In this paper we evaluate indicators of the expectations underpinning employment insecurity, a concept that has taken center stage since the world-wide economic downturn in 2008.

Feelings of employment insecurity have been found to generate anxiety and substantially lower the well-being of workers and their dependents, to inhibit consumer spending, and to reduce wage growth (Wichert, 2002; Benito, 2004; Lusardi, 1998; Carroll et al., 2003; Campbell et al., 2007). This large impact of insecurity on well-being is thought to account in part for the highly detrimental effects of aggregate unemployment on the average well-being of populations (Di Tella et al., 2003). Insecurity is naturally greater in a business downturn, but beyond that it is natural to look for ways of reducing insecurity perceptions. Bryson et al. (2004), for example, find that firm-level job protection policies do have the desired effect of reducing employees' feelings of insecurity. Clarke and Postel-Vinay (2004), in contrast, find that the presence of economy-wide employment protection laws makes workers less satisfied with their job security. To account for this apparently perverse finding they hypothesise that protection raises the cost of job loss, and that the consequent downward effect on satisfaction outweighs the impact of the reduced risk of job loss. This study is but one illustration of the need for the different expectations behind feelings of employment insecurity to be more precisely specified in survey questions (Green, 2006). Employment security comprises multiple parts, involving uncertainty over job content, job loss and its potential cost while unemployed, and future wages of any post-displacement job. Unambiguously phrased survey instruments to capture each of these elements of uncertainty are needed, together with tested protocols to allow respondents to represent their expectations as reliably as possible.

To make progress in the understanding of employment insecurity, we contribute new evidence about the validity of measures of two core components: expectations of job loss, and expectations of job replacement conditional on job loss[1], focusing on the match between

[1] We do not cover measurement of costs while unemployed, nor of insecurity about the work itself. The former element is partially captured by social security benefits. Neither element is covered in any longitudinal survey where an evaluation would be possible.

individual expectations and realisations. We first develop the case that expectations of job loss can be effectively measured through direct survey instruments. Longitudinal data is required, and we use data from the two high-quality representative panels (the German Socio-Economic Panel and Household Income and Labour Dynamics in Australia) which include variants of the relevant questions. We find that in both countries expectations of job loss are strongly correlated with subsequent job loss in the anticipated period. Furthermore, expectations of finding a good replacement conditional on job loss are correlated with subsequent success. Nevertheless, it turns out that both German and Australian workers show unwarranted pessimism in their job loss expectations: on average employees' subjective probabilities of job loss are twice as high as the outcome frequency. Conversely, expectations of job replacement show unrealistic optimism. These biases could be expected to have implications for the impact of insecurity on wage bargaining and on insurance and consumer spending.

An important methodological issue in the measurement of expectations is the choice of response scale for survey items. A cardinal scale on the risk of job loss, in which respondents are asked to state the probability of job loss, has considerable attraction if respondents can sensibly and reliably answer on such a scale (Manski, 2004). With a probabilistic scale, interpersonal and inter-cultural comparisons of perceptions can be made. Use of non-probabilistic scales with verbal descriptors relies on assuming that respondents have a shared and internally consistent understanding of the descriptors, and restricts comparisons to ordinal rankings. Yet while some small-scale studies in psychology imply that it is possible to elicit probabilistic expectations in certain domains, we lack evidence as to whether the response scales are valid, and whether they contain more information than ordinal scales. We provide some tests of the feasibility and validity of a cardinal probability scale. Taking advantage of a decision to change the scale in an otherwise consistent series on expectations of jobs loss, we compare the predictive power of a cardinal scale with that of an ordinal scale. We find, not only that the cardinal scale has criterion validity, it also appears to do somewhat better than the ordinal scale. However, there is evidence of some non-linearity in the association between expectations and realisations.

The paper proceeds as follows. The next section reviews arguments and existing evidence concerning the use of probabilistic or ordinal scales when measuring expectations, and links to previous studies of pessimism and optimism in expectations. Section 3 describes the data, the main findings are presented in Section 4, and Section 5 concludes with a discussion of the implications for survey question design and for employment insurance.

2. Issues in the Measurement of Employment Insecurity

The concept of employment insecurity refers to all forms of welfare-reducing uncertainty surrounding employment. It encompasses job insecurity (uncertainty over the continuity of the current job), uncertainty over the work itself, and uncertainty over future labour market prospects. This broad definition is often simplified in analysis to focus on two components of the mean expected welfare loss arising from the uncertainty: the probability of job loss and its cost (including non-pecuniary losses). The latter depends on out-of-work benefits and on the uncertainty over the quality of, and time taken to find, another job. In attempting to best capture employment insecurity, survey items typically focus on expectations over the two uncertainties: the probability of job loss, and the probability of finding another equally good job.

Thus, the work orientations module of the International Social Survey Programme (ISSP) of 1989, 1997 and 2005 asks for the extent of agreement/disagreement with the statement: 'My job is secure'. We surmise that this instrument mainly captures the risk of job loss, but its meaning is imprecise and the response scale is not commensurate with capturing degrees of risk interpreted as probability. The second uncertainty can be phrased in terms of probabilities, but is sometimes framed as a degree of difficulty. For example, the ISSP asks: 'How difficult or easy do you think it would be for you to find a job at least as good as your current one?'. The Finnish Quality of Work Life surveys are of interest because they also tap uncertainty about the work itself (for example the fear of transfer to another set of tasks), but they allow only binary responses (Lehto and Sutela, 2009). Less satisfactory still is the approach in the European Community Household Panel which asks 'How satisfied are you with your present job in terms of job security?'. Here, the question is open to different interpretations, not least because the degree of satisfaction also depends on comparison norms.

Good survey practice favours unambiguous questions, and since employment insecurity involves subjective expectations these should be measured. But, can these be measured validly? Manski (2004) makes a powerful argument for economists to directly measure expectations of future events. Rather than assuming an ideal process of expectations formation (usually 'rational') and then identifying decision processes from observed behaviour, Manski advocates combining choice data with self-reported data on perceived expectations. Respondents should be asked to report the perceived likelihood of an event happening. In respect of employment expectations this is the approach followed by, for example, the US General Social Survey, the Survey of Economic Expectations (SEE), the British Skills Surveys (BSS), and the British, German and Australian household panels.[2]

[2] The British Household Panel Study only asked this question twice, in 1996 and 1997.

But how might respondents report that likelihood? A common procedure is to use an ordinal verbal scale such as ‘no chance’, ‘very unlikely’, ‘unlikely’, ‘evens’, ‘quite likely’, ‘very likely’ (e.g. in the BSS). Yet it is possible that these descriptors are not interpersonally comparable, if different individuals do not have a shared understanding of the descriptors. An alternative procedure is to use a probabilistic scale (as in the SEE). A cardinal ranking would mitigate the problem of interpersonal comparisons because the meaning of any given percentage is, in principle, objective. Moreover, a cardinal measure of risk is potentially more parsimonious as an explanatory variable in econometric analyses. Manski (2004) cites evidence that respondents are willing to make probabilistic judgements, and finds no indication of internal inconsistencies in these cases. We lack evidence, however, of whether cardinal measures of risk have a superior predictive power. The counter-argument is the assertion that respondents may not be capable of making reliable cardinal probability judgements. Even though they are willing to report subjective cardinal probabilities, these might not correspond with objective circumstances. Lukasiewicz et al. (2001) note the paucity of work validating scales of risk perception, and provide some evidence in favour of using verbal scales for measuring instantaneous perceptions of risk. Erev and Cohen (1990) report experimental evidence that verbal and numerical scales were equally efficient at conveying event probabilities, and that judgemental biases (wishful thinking and/or the conjunction fallacy) occurred independently of which kind of scale was used.

One issue to be investigated in this paper, therefore, is whether cardinal scales for questions on job loss expectations perform better than ordinal scales. An adjunct to this question concerns how to phrase the probabilistic scale. Options are to ask respondents to report probabilities using any integer from 0 to 100, to present single points on a coarser scale, or to present banded ranges.

To assess the content validity of subjective expectations data, one can first check whether they conform to a plausible model of expectations formation. The research is positive in this respect. Whether measured explicitly or implicitly in terms of subjective expectations, indicators of job loss track labour market tightness and fit a plausible model of how expectations are formed reflecting objective labour market factors such as the permanent/temporary status of the job contract, education level, prior unemployment experiences and other social encounters with unemployment (Schmidt, 1999; Green et al., 2000; Manski and Straub, 2000; Campbell et al., 2007; Stephens, 2004; McGuiness and Wooden, 2009; Green, 2009; Linz and Semykina, 2008).

The more stringent test of content validity, however, is to check how accurately the perceived expectations are realised. Comparing expectations with realisations, described as ‘calibration’ in the psychological literature on judgmental biases, two aspects are of interest, corresponding to the marginal and the average expectation. The subjective expectation

acquires validity as a forecast to the extent that a marginal rise in the perceived probability of an event is reflected by a rise in its frequency.[3]

The average expectation in a group would be insignificantly different from outturns if expectations were rational. However, many previous studies have found evidence of systematic non-rational expectations (Bovi, 2009), and for a good measure of expectations we do not require there to be zero forecast errors. Indeed the direction of any biases is of interest in itself. Over-prediction of events is common, according to psychological research, in low frequency cases (Armor and Taylor, 2002). If the average expectation of an undesirable event is greater (less) than the average outturn, that group is said to suffer from unrealistic pessimism (optimism). Systematic miscalibration has been found in a number of fields, usually revealing overconfidence. Smokers, for example, typically suffer from unrealistic optimism: they underestimate their chances of contracting lung cancer, an error that is usually attributed to information deficit (e.g. Weinstein et al., 2005). Similarly, drivers and motorbike riders under-estimate the chances of having an accident (e.g. Rutter et al., 1998). A prominent explanation is that drivers may suffer from an illusion of control (Weinstein, 1980; 1984). Dominitz (1998) demonstrates optimism within economics, though see Clark and Friesen (2009) or Das and van Soest (1997, 1999) for counterexamples. A recent strand of theoretical literature offers economic explanations for the generation and persistence of optimistic biases: Brunnermeier and Parker (2005), for example, model the optimal adoption of optimistic beliefs that raise utility but distort behaviour.[4] In other fields pessimism is found, for example with respect to the safety of air travel. One source of pessimism in the case of negative risk is said to be an individual's propensity to worry, since worriers are more likely than others to rehearse the reasons why negative events could happen (Constans, 2001). While there is no comprehensive psychological account of pessimism, the salient point of the heuristics and biases literature is that accuracy of predictions is likely to be related to the availability of the experience to respondents, and their ability to process the relevant information.

In respect of employment insecurity, the few extant findings concern the risk of job loss. British and older Canadian employees have been found to be unrealistically pessimistic about job loss, but can nonetheless partially predict it (Campbell et al., 2007; Stephens, 2004). In these studies it is possible that the correlation between expectations and realisations could be biased by unobserved heterogeneity, whereby individual traits are linked both with perceptions and with the precariousness of jobs. There are no studies hitherto of whether employees correctly anticipate the difficulty of finding adequate job

[3] If expectations were unrelated to realisations, the expectations might still be valid for other reasons, e.g. if they predicted insurance choices or well-being; however, most economists would, we suspect, feel uncomfortable using expectations data in such circumstances.
[4] See also Bénabou and Tirole (2002), Glaeser (2004) and Van den Steen (2004).

replacements subsequent to involuntary job loss.[5] In this paper we study Germany and Australia, two countries with rather different institutions and unemployment experiences. The key issues to be addressed are: whether and how well realisations of job loss and of finding a good new job are predicted by our indicators of employees' expectations, both before and after controlling for standard job and personal characteristics; whether the assessment of the predictive power of expectations of job loss is affected by unobserved individual heterogeneity; and whether cardinal probability scales with numeric descriptors are preferable to ordinal scales with verbal descriptors. In addition, we examine whether there is unrealistic pessimism or optimism among employees, in respect of both the risk of job loss and the probability of finding a new job as good as the previous one.

3. Data

To investigate these issues we make use of two longitudinal surveys that collect suitable employment expectations data: the German Socio-Economic Panel (GSOEP) and the Household Income and Labour Dynamics in Australia (HILDA) Survey.

GSOEP is a panel survey of households in Germany including, from 1990 onwards, East Germany. The first wave in 1984 comprised 12,290 individuals in 5,921 households; the sample is depleted annually with some attrition, and replenished with regular additions through household splitting and expansion, and through occasional refreshment. Full details are given at the website: http://www.diw.de/english/sop/.[6]

Respondents are regularly asked about their expectations in the labour market. Respondents in employment are asked: 'How probable is it in the next two years that you will lose your job?', and the question is posed with the same words every time. Other expectations are also enquired about, for example retirement and promotion possibilities, though the range of these varies across waves. Prior to 1999 the response scale to the expectations questions was an ordinal scale with descriptors: 'definitely', 'probably', 'probably not', 'definitely not'.[7] From 1999 on, while the question wording on job insecurity remained the same as in earlier waves, the response scale was cardinal. Respondents were asked to indicate the likelihood of the event happening by answering on a 11-point scale labelled 0,

[5] There is a separate literature on estimates of the wage loss from job displacement – see Green (2006) for a review – but this does not connect expectations with ex post realisations.

[6] The data was made available to us by the German Socio-Economic Panel Study (SOEP) at the German Institute for Economic Research (DIW Berlin). The data used in this paper were extracted using the Add-On package PanelWhiz v2.0 (Nov 2007) for STATA. PanelWhiz was written by Dr. John P. Haisken-DeNew (john@panelwhiz.eu). The following authors supplied PanelWhiz SOEP Plugins used to ensure longitudinal consistency, John P. Haisken-DeNew (16 plugins), Markus Hahn and John P. Haisken-DeNew (14 plugins). The PanelWhiz generated .do file to retrieve the SOEP data used here and any Panelwhiz Plugins are available upon request. Any data or computational errors in this paper are ours. Haisken-DeNew and Hahn (2006) describe PanelWhiz in detail.

[7] The English version translation was different before 1998, but the German scale remained unaltered; the translation given here, used for 1998, is most accurate.

10, 20 … to 100, where 'the value 0 means that it is certain not to take place' and 'the value 100 means that it is certain to take place'.[8] The switch from an ordinal to a cardinal scale enables us to carry out a 'before-after' test of the predictive powers of the two scales. For the validity test we use data from four waves before and four after the change of response scale in which the question was asked, but also focus down on the years immediately before and after.

Also required is an indication for whether job loss is realised in the period subsequent to the expectation being expressed. Job loss here is defined as a job termination due to dismissal, a temporary job or apprenticeship being completed, or the close of the business (including for self-employed people). Dismissal is the most frequent of these three reasons. Note that job loss does not necessarily imply a period of unemployment. For the expectation expressed in year t, we have taken the relevant 2-year period to be during year t or year t+1.

To capture expectations of job replacement conditional on job loss, respondents are asked 'If you lost your job today, would it be easy, difficult, or almost impossible for you to find a new position which is at least as good as your current one?', and can reply across the 3-point verbal scale 'easy', 'difficult' or 'almost impossible'.[9] Compared with the item measuring job loss this is less precise, in both content and response scale. To measure realisations, we took as our assumption that 'at least as good as' meant that, in the year following job loss, the respondent has a job which generates labour income at least 90% of the current gross labour income, and zero if the respondent has no job or one with a lower wage.

HILDA is an annual panel survey of Australian households from 2001 onwards.[10] The first wave was drawn from a probability sample, and comprised 7,682 household interviews, with a response rate of 66%. Within households, 92% of eligible (aged over 15) persons responded, giving 13,969 individuals. The questionnaires investigate labour market dynamics, family dynamics, and economic and subjective well-being. Full details of the panel, including subsequent attrition rates and sample renewal procedures, are given in the HILDA Users Manual available from http://melbourneinstitute.com/hilda/. We use data from the first seven waves, 2001 to 2007.

[8] Extrapolating to the rest of the scale, it seems reasonable to take all the scale points to represent percentage probabilities at decile points. Nevertheless, nowhere is this explicitly stated, nor to our knowledge is this interpretation tested, and we think it would have been better to make it explicit in the question.

[9] The question is asked in all years except 1996 and 1998.

[10] The HILDA Survey Project was initiated and is funded by the Australian Government Department of Families, Housing, Community Services and Indigenous Affairs and is managed by the Melbourne Institute of Applied Economic and Social Research. The findings and views reported in this paper, however, are those of the authors and should not be attributed to any of the aforementioned organisations.

Each year the HILDA survey asks a number of questions about the labour market expectations of respondents, and for those in employment these questions focus on expectations of job loss, of (voluntary) quitting, and of getting another equally good job in the event of job loss. We restricted our sample to those who were employees when they express their expectations of job loss. The question on risk of job loss, adapted from the Survey of Economic Expectations, is: 'What do you think is the per cent chance that you will lose your job during the next 12 months? (That is, get retrenched or fired or not have your contract renewed).' This question is appropriate, since its meaning is unambiguous. Each respondent can be expected to have the same understanding of the question (in particular, about what is meant by 'loss of job') as other respondents and researchers. The issue here largely revolves around the response scale: respondents simply give a number anywhere between 0 and 100 inclusive. Whether such fine distinctions add information about subsequent realisations is an open question.

From Wave 2 onwards, some questions address recent employment and unemployment experiences, and in particular respondents are asked to give the main reason why the job that they held at the previous interview had ceased. We collapsed the multiple reasons into two types, according to whether they had ceased working in the job voluntarily, or whether this had been involuntary. The latter included: dismissal, employer out of business, laid off, made redundant, no work available, retrenched, temporary or seasonal job.

Expectations of job replacement are captured in HILDA with the item: 'If you were to lose your job during the next 12 months, what is the per cent chance that the job you eventually find and accept would be at least as good as your current job, in terms of wages and benefits?', with the accepted response range from 0 to 100. Here, in contrast with the aspired precision of the responses, the phrase 'as good as' still needs interpretation. For the purposes of this paper, we computed a variable '*asgoodas*', equal to one if, in the year following job loss, the respondent has a job paying at least 90% of the weekly wage in the current job, and zero if the respondent has no job or one with a lower wage. Fortunately, the pattern of findings was not sensitive to alternative specifications embodying varied interpretations of 'as good as' using either a different threshold, or hourly wages, or a 2-year horizon.

4. Findings

4.1 Distribution and Consistency of Responses

Do the responses suggest that respondents have a good grasp of the meaning of the expectations about which they are being questioned? A basic requirement for a survey item is that respondents take sufficient meaning from the question and response scale to be able to provide an answer. Re-assurance is forthcoming for the expectations items used in both GSOEP and HILDA. For GSOEP, the proportion of respondents unwilling or unable to answer the question was 1.54% and 1.39% in the period before and after the change in the scale respectively. For HILDA, there were only 0.3% missing responses among employees. Respondents are thus willing to report expectations against either ordinal or cardinal scales. Possibly, the very low figure for HILDA is a reflection of its unambiguous question wording. For the expectations of job replacement conditional on job loss, there were 1.6% missing values in Germany, and 2.5% in Australia.

A second criterion for a good measurement instrument is that the distribution of responses should populate all scale response points. The large majority do not expect to lose their job. In the GSOEP (ordinal) period, about one in ten perceived that job loss was probable or definite in the following two years, while 33% said that they would definitely not lose their job. In the ensuing GSOEP (cardinal) period, the proportion answering that the chance of job loss was zero was 42%. The difference from the immediately preceding years using the ordinal scale suggests that some respondents replying ‘probably not’ are induced to reply zero when presented with a cardinal scale. There are data spikes at both 50% and 100%, but every point in the 11-point distribution is well-populated. Spikes at decile points, and especially at 50% and 100%, are also found in the HILDA distribution, where respondents could answer with any integer number 0 to 100. Very few took the opportunity to respond between 5-percentile points. The simplest explanation for these spikes is that respondents are unable or unwilling to make fine judgements about probabilities, and so cluster their replies at round numbers. It is questionable whether those who respond off decile points can really be that discerning, and we provide a simple test of this below.

Third, a good indication that respondents have the cognitive skills to make numerical probability judgements is whether their perceptions are internally consistent. It is possible to test for cases of inconsistency in the following way: HILDA respondents also give their expectations of voluntarily leaving their jobs (quitting or retiring, hence ‘quitting’ for short). While there can be non-zero probabilities of both occurring for any individual, it would be illogical for an individual to report perceived probabilities of mutually exclusive outcomes that sum to more than 100%. The questions on job loss and quitting expectations were asked one immediately after the other in the HILDA data, but (as far as we can tell) no check is made during the interview to pre-empt any replies that are inconsistent in this way. It emerges that,

in 5.3% of cases, the sum of the probabilities of job loss and quitting is greater than 100%. At the extreme, there were 305 cases (0.6%) over the seven waves of people predicting that both events would happen with certainty, despite the fact that they are mutually exclusive. It is likely that these respondents were not distinguishing between expectations of voluntary and involuntary mobility. This finding casts doubt on how well even properly-formed questions are understood by a small minority.

4.2 Perceptions and Realisations of Job Loss

Next we investigate how closely respondents' expectations of job loss match their realisations of job loss. We group respondents according to their perceptions of the risk of job loss – in the ordinal categories and at their precise decile scale points for Germany, and grouped into decile bands for Australia. As can be seen in Tables A1 and A2, on average respondents in both Germany and Australia tend to overestimate the risk of job loss by a factor of approximately two. In Germany, the mean perceived probability of 2-year job loss between 1999 and 2005 was 21.4%, but the average realised incidence of job loss in each subsequent two year period was 9.7%. Corresponding figures for the 1-year risk in Australia over 2001-2007 were 10.1% and 4.9%. (See Appendix Tables A1 and A2).

In fact, in both countries, the cardinal scales indicate that overestimation of risk occurs for all groups that envisage a non-zero risk of job loss. In contrast, those who report that there is no chance of losing their job are underestimating the risk to a small extent. For example, the zero probability group experienced a 5.9% incidence of job loss in Germany.

The verbal ordinal scales also indicate overestimation of risk in Germany for those who perceive some risk: among those in the 'definitely' category, the incidence of job loss was only 42%. This amount is identical to the job loss incidence found for those answering 100% likelihood on the cardinal scale. Similarly, underestimation occurs at the no-risk end of the scale: job loss incidence was 6.4% among those in the 'definitely not' category.

Despite this overestimation on average, there is a positive relationship between perceived job loss band and the subsequent incidence of job loss. In the case of Germany this relationship is monotonic, and for Australia it is nearly so. With few exceptions, being in a group that expects a higher chance of job loss is indeed linked with a significantly higher incidence of job loss. We take this finding as confirming that responses do convey useful information about employment prospects.

To illustrate, Figure 1 shows the relationship between the ordinal response categories and the actual job loss probability for Germany in the 1990s. As can be seen, there is a monotonic-increasing relationship between expectations and outturns, although little difference on actual job loss between the bottom two categories. For the cardinal scales, Figure 2 shows that the relationships between perception and realisation in Germany and

Australia are quite similar. The 45^{o} line denotes perfect prediction – that is when outcomes are the same as perceptions. The outcome lines slope upwards reflecting predictive power, but less steeply than the 45^{o} line, reflecting attenuation bias from errors in subjective expectations across a finite scale. Both the finding of the presence of overestimation (together with underestimation at the no-risk end of the scale), and the finding of a near-monotonic relationship between perception and realisation, make the pattern of responses from Germany and Australia similar to those in Britain and Canada as shown in Campbell et al. (2007) and Stephens (2004) respectively.

Finally, note that the relationships shown in Figure 2 are non-linear at the top end of the scale in both countries. This finding implies a shortcoming of the cardinal scale, since such a scale assumes that a given change in perceived probability is reflected in the same change in frequency of job loss, whatever the initial level of uncertainty.

It is possible that the observed overestimation could be due to strategic quitting, whereby those expecting to lose their job pre-empt this event by quitting voluntarily. If large numbers of respondents were doing this, the 'true' proportion losing their job might come closer to that expected. However, there is only a very weak relationship between job loss expectation and quitting[11], insufficient to account for much overestimation. Another possibility is that many respondents were right to expect job loss, but were wrong in their estimation of how imminent it was. For example, for the HILDA respondents, if the job loss were expected in one year but came, instead, within two years, the realisation of expectations might be seen as less far out. However, only 1.9% additional job losses are realised in the second year, and this subsequent job loss is not positively related to the bands for the probability of job loss in one year.[12] We thus conclude that overestimation of job loss is a genuine phenomenon.

4.3 Predicting job loss

We now turn to examine the degree to which individuals' perceptions of the probability of job loss are useful predictors of subsequent job loss outcomes. Tables 1 and 2 contain the findings for Germany for the ordinal and cardinal perceptions of job loss scales respectively, while Table 3 reports the results for Australia. Given the binary nature of the dependent variable ('job loss'), logit regression coefficients are reported in all cases.

In Table 1, individuals' responses using the ordinal response scale for the fear of job loss recorded in 1993, 1994, 1996 and 1998 are correlated with the actual job loss outturns over the subsequent two years. The omitted category of individuals' perceptions of job loss is 'Definitely not'. Three different estimators are presented in Columns (1), (2) and (3) – pooled

[11] A 1% point rise in the perceived probability of job loss in Australia is associated with 0.04% point rise in the quit rate, i.e. very modest in relation to the mean quit propensity (17.2%).
[12] An additional table showing these links is available on request from the authors.

logit, random effects logit and (conditional) fixed effects logit estimates respectively. Columns (4), (5) and (6) include a number of additional control variables which may also impact upon individuals' probability of losing their job. These are gender, a quadratic in age, whether the individual is a graduate (or equivalent), whether they have had an unemployment spell in the previous year, whether they work in the private sector, or in a large establishment (> 20 employees) and, finally, whether they have a temporary job contract.

As can be seen from Column (1), individuals' fear of job loss is strongly and significantly correlated with their subsequent job loss propensity. The strongly monotonic-increasing relationship between perceptions of job loss and job loss probability seen in the raw data in Figure 1 is replicated in these logit estimates. It is also evident in Column (2) where the random effects specification takes into account the fact that there are repeated observations on the same individuals. In Columns (1) and (2) of Table 1, it remains possible that unobserved factors, such as personality differences, are systematically affecting both the incidence of job loss, and the perceptions of the risk of job loss. If that were the case, the estimated coefficients would be biased, so one could not be sure that the perceptions themselves were predicting the future outcomes. One way to mitigate this problem is to estimate a (conditional) fixed effects logit specification, as reported in Column (3). The coefficient estimates are somewhat reduced compared to those in Columns (1) or (2), but nevertheless remain highly significant and monotonically increasing across the ordinally ranked scale point descriptors.

A further step is to condition explicitly for other observable predictors of job loss. Column (4) presents pooled logit estimates including the control variables listed above. The coefficients on these control variables indicate that the relationship between job loss and age shows a U-shape, while individuals who are more highly educated, work in the public sector and/or in large establishments, or in jobs with indefinite/permanent contracts, are all less likely to lose their jobs. Finally, those who have been unemployed in the last year are more likely to lose their job once more, a finding usually attributable to scarring. However, despite the inclusion of these statistically significant determinants of the probability of job loss, the perceived probability of job loss continues to be a statistically significant determinant of job loss outcomes. Indeed, the coefficients are little changed from the specifications which do not include these controls. The same is true for Columns (5) and (6) which present the random effects logit and (conditional) fixed effects logit estimates including controls.[13] Thus the perceptions data do appear to contain private information about job loss risk that is not revealed by observed conventional indicators of job loss risk.

[13] The coefficient on recent unemployment reverses its sign in the fixed-effects specification. This may be due to dynamic effects of unemployment scarring, or to a selection-bias effect.

Tables 2 and 3 have a similar format to Table 1, but instead report the results obtained using the cardinal scale responses for the fear of job loss for Germany and Australia respectively. Once again, individuals' perceptions of their likelihood of losing their job are strongly and significantly correlated with the probability that they actually do subsequently lose their job; and this conclusion holds for the pooled, random effects and fixed effects estimations in both countries. Panel A reports the results when the perceptions of job loss are included as the discrete decile categories for GSOEP, and grouped into banded decile intervals for HILDA. The excluded category for Germany (Australia) is a perception of 0% (0-4%) job loss probability. The coefficients can be seen to replicate the pattern in the raw data reported in Tables A1 and A2 and illustrated in Figure 2. The estimated impacts of the control variables follow the same pattern in the two countries, which is the same as that shown in Table 1 for Germany using the ordinal scale available prior to 1999.[14]

As an alternative specification, the probabilistic scale can be used as a continuous measure of the perceptions of job loss. The results from treating the perceptions data in this manner are presented in Panel B of Table 2 and Table 3 for Germany and Australia respectively[15]. When compared against the specifications in Panel A which treat the responses in decile points, the AIC typically favours the discrete treatment of perceptions while the BIC prefers the more parsimonious single continuous variable – a consequence of BIC penalising the extra regressors much more heavily than AIC.[16]

A related issue with the continuous scale is whether the off-spike entries in the Australian data add to the predictive power of the expectations data. To test this we recoded the 357 entries for job loss risk above 25% that were off decile spikes, each to its nearest decile point; then compared the explanatory power prior to recoding. The result showed a very minor improvement, rather than a deterioration, in the log likelihood, with all specifications. From this we conclude that the precision of off-spike stated probabilities such as, say, 67%, is spurious.

4.4 Ordinal vs cardinal response scale?

We now examine the relative performance of the ordinal and cardinal response scales for the perceived risk of job loss in predicting actual job loss. In particular, we provide some

[14] There was a minor change in wording of the HILDA question on probability of job loss, from Wave 2 onwards. For robustness we re-ran the estimates omitting Wave 1; we confirm that the coefficient estimates are not significantly different from those reported for all 7 waves.
[15] The coefficients on the control variables in columns (4), (5) and (6) are little different from those in Panel A and so are not reported.
[16] These information criteria are defined as: AIC = $-2ll+2k$; BIC=$-2ll+k\ln N$.

measures of whether the use of the ordinal or the cardinal perception scale provides a 'better' predictive performance. Table 4 summarises our findings.

There is a plethora of R^2-type measures for limited dependent variable models such as the logit regressions presented here. Useful surveys are presented by Windmeijer (1995) and Veall and Zimmermann (1996) amongst others. Table 4 reports two such R^2 measures. The first is the most commonly employed Pseudo-R^2 which is due to McFadden (1973), and is defined as the proportionate gain in the log-likelihood (relative to an intercept only model). The second measure is due to McKelvey and Zavoina (1975). This is of the 'explained variation class' of measures in that it mimics the standard R^2 in OLS since it can be interpreted as the ratio of explained sum of squares to the total sum of squares (Veall and Zimmermann, 1996). Simulations suggest that this measure most closely approximates the OLS R^2 for the underlying (unobserved) latent variable model (Hagle and Mitchell, 1992; Windmeijer, 1995) and hence it is an attractive choice.[17]

The top panel of Table 4 reports the goodness of fit statistics for the GSOEP specifications, first for the ordinal period, then for the cardinal period, with the cardinal responses treated as decile points and as a continuous variable. The results for the two goodness-of-fit measures suggest that the two specifications with the cardinal scale out-perform the estimates using the ordinal scale. Certainly, there is no suggestion that the cardinal response scale is worse, in general, than the ordinal response scale in predicting actual job loss. Second, there would appear to be little to choose between the discrete and continuous cardinal scales in terms of the predictive performance of the model – the R^2 measures are almost identical for the two specifications, a finding that is replicated using the HILDA data as reported in the panel at the bottom of the table.

There is an important weakness in the above comparisons between the predictive performance of the ordinal and cardinal response scales. In estimating separate equations for the ordinal and cardinal scales, we are not comparing the same *individuals* using the different response scales. Thus, in Table 4 we also report the findings when analysis is restricted to those individuals present in the GSOEP both before and after the change in measurement scale from ordinal to cardinal. This allows us to compare the predictive performance of the same individuals using both scales. Results for the 6,696 individuals who answered the ordinal scale question in 1998 *and* the cardinal question in 1999 are shown in the middle panel of Table 4.[18] As can be seen, the same individuals do rather worse in terms of the two R^2-type measures when using the ordinal scale.

[17] We did examine alternative goodness-of-fit measures but these confirmed the general findings reported in the text.

[18] Of course, there is a potential selectivity issue here in that the perception of job loss question requires individuals to be currently in employment. Individuals who correctly forecast in 1998 that they

4.5 Re-employment perceptions

Finally in this section we examine the information content of the reported perceptions regarding job replacement in the event of a job loss.

Table A3 reports the proportions regaining a job as good as the current one according to the perceived likelihoods for the sub-sample of German workers who did actually lose their jobs. As shown in Figure 3, individuals do appear to have a strong awareness of their likelihood of success in their employment prospects in the event that they lose their jobs – those who said it would be easy to get as good a job are twice as likely to do so than those who said it would be almost impossible. However, even among those who said it would be easy, less than half have managed to obtain as good a job, and hence these individuals can perhaps be regarded as being too optimistic. In contrast, those who said it would be almost impossible to secure as good a job have almost a one in five chance of doing so, and hence they can be regarded as somewhat pessimistic. Table 5 reports a number of specifications which take into account other potential determinants of re-employment. Column (1) replicates the pattern in the raw data using a pooled logit estimator, while Column (2) is the random effects specification. Columns (3) and (4) repeat the logit estimation in Columns (1) and (2) but this time with the vector of control variables that we used previously in our investigation of job loss.[19] The strong positive relationship between individuals' perceptions of job replacement and the probability of regaining as good a job remain.

Table A4 reports the proportions regaining as good a job as their current job following a job loss, according to grouped Australian perceptions data[20]. As illustrated in Figure 4, there is again a strong positive relationship between perceptions and out-turns. On average, Australians are unrealistically optimistic since, as shown at the foot of Table A4, just under half of individuals who lose their jobs get a replacement that is at least as good, while two-thirds of those individuals thought they would do so.

Table 6 replicates the analysis presented in Table 5 using the HILDA data. While most of the control variables are statistically insignificant, it remains the case that there is a strong positive and significant relationship between outcomes and perceptions of job replacement.

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would lose their jobs may not have found another job by 1999, and hence we may be missing those who can best predict.

[19] There are rather too few repeated observations on individuals to be able to estimate a conditional logit (fixed effects) specification – most individuals in the panel who lose their job only do so once.

[20] We group the data into quintiles because there are relatively few observations.

5. Conclusions

Indicators of expectations of labour market agents are potentially valuable for analysing a wide range of labour market behaviour, and they are in particular at the heart of the measurement of employment insecurity. However, before their wide-spread adoption in labour market research is likely, it will be necessary for researchers to develop greater understanding of their validity. To capture employment insecurity there is a good case for using questions that separately capture perceptions of the risk of job loss, uncertainties about the work itself, and uncertainties about the consequences of job loss. To measure these perceptions one might opt to defend any format that successfully elicits expectations, whether or not the expressed expectations are realised. If workers say they have a high fear of job loss this might affect their behaviour even if that fear is not warranted. Normally, however, economists will find expressions about labour market expectations of most interest if they convey private information – that is, information about the respondents' particular circumstances or personal intentions that would not typically be collected in other ways by researchers.

In this light, we have reported several new findings based on the two extant, nationally representative, panels that regularly gather direct information about labour market expectations, the German Socio-Economic Panel and the Household Income and Labour Dynamics in Australia Survey. First, the expectations of job loss questions in both cases are found to robustly predict the probability of subsequent job loss, thereby providing solid support for the value of such questions in labour market analysis. While similar findings had been reported for a sample of older workers in Canada and for a nationally representative sample in Britain, we have demonstrated this predictive power for the first time using a fixed-effects panel estimator, and in two different nationally representative samples; there can now be some considerable confidence in the use of such expectations questions.

Our second finding is that employees' perceptions of re-employment probabilities in the event of job loss are also robust predictors of their outcomes. We believe that this adds further support to the utilisation of expectations data in employment research.

Third, the analysis of expectations and realisations establishes that there is merit in using cardinal rather than ordinal scales. Since the meaning of numerical scale points is unambiguous while that of verbal descriptors might differ among respondents if their understanding of language is heterogeneous or if the words are vague, cardinal scales are in principle preferable. Moreover, cardinal scales offer analytical advantages, in that marginal changes in probability are commensurate along the scale, which is not true of ordinal verbal descriptors. Nevertheless, it was an open question as to whether the responses on cardinal scales in practice can capture valid representations of what workers expect, given that not all respondents can be assumed to have sufficient skills and forethought. We have compared

goodness-of-fit measures in GSOEP from before and after the switch from ordinal to cardinal scales in our analysis of job loss, and found that the cardinal scales appear to perform better on these grounds. It would appear that individuals can systematically assess the likelihood of important events such as job loss and re-employment using numerical, probabilistic scales, and do so somewhat better than with ordinal verbal scales. Nevertheless, the numerical scales revealed a small minority of inconsistencies in the responses, showing imperfect understanding of the questions.[21]

Fourth, although the expectations are found to have to have predictive power, in both cases and in both countries there are significant biases. There is a pattern of unrealistic pessimism over job insecurity (over-estimation of the chance of job loss) for all workers who have any fear of job loss, while those who think that they have no chance at all of job loss underestimate the small risk they face. The average perceived chance of job loss is roughly twice the frequency of subsequent occurrence. Conversely, individuals' expectations of re-employment tend to be optimistic on average, with the proportion of job-losing Australians being re-employed in equal or better jobs being 19 percentage points less than the average probability that those individuals had anticipated. While these biases do not invalidate the use of expectations data, they invite explanation, which should be the focus of further research. Also warranted is a consideration of the implications of pessimism and optimism for private insurance demand, and for other outcomes including consumer demand and well-being. *Prima facie*, there would seem to be contradictory impulses, with job insecurity pessimism implying over-insurance while unrealistic optimism suggests the opposite.

In addition to these implications for studying further the links between expectations and economic behaviour, our findings contain implications for how survey designers should go about measuring expectations in the field of employment. Given the resurgence of unemployment around the world in the current era, we believe that there is a good case for measuring employment insecurity explicitly in major labour market surveys, and the findings here indicate that it is worth collecting direct measures of workers' subjective expectations. Unlike in many previous studies of job or employment insecurity, the specific employment event about which expectations are formed needs to be clearly formulated, and there is a case also for extending the domains reviewed here to include uncertainties about work characteristics. Another further extension would be to introduce and validate questions addressing the confidence or ambiguity with which expectations are held. Our analyses of the existing data show that it is both viable and advisable to utilise numerical scales. The particular scale to be used should ideally allow for the non-linearity at the upper end of the scale shown in Figure 2, which suggests that it would not be entirely reliable to treat a

[21] Inconsistencies might also occur, but be undetectable, with ordinal scales.

marginal change in job loss expectations as proportional to a marginal change in the objective incidence of job loss. The scale should also not attempt to capture unrealistic precision. Hence, instead of soliciting responses as continuous percentages, a set of discrete percentage points is preferable, though this has to be balanced against the extra time and space within the survey protocol.[22] Extra variation can be allowed for around the well-populated parts of the distribution; hence, in the case of job loss risk a sensible set of scale percentage points might be: 0, 5, 10, 15, 20, 30, 40, 50, 60, 70, 80, 90, 100; while in the case of the difficulty of re-employment, decile points capture the very large proportion of the distribution.

[22] A telephone interview mode could argue in favour of asking directly for the continuous percentage.

References

Armor, D. A. and S. E. Taylor (2002). "When predictions fail: The dilemma of unrealistic optimism", in T. Gilovich, D. W. Griffin and D. Kahneman (eds.), *Heuristics and biases: The psychology of intuitive judgment*, 334–347. New York: Cambridge University Press.

Bénabou, R. and J. Tirole (2002). "Self-Confidence and Personal Motivation". *Quarterly Journal of Economics* 117(3): 871-915.

Benito, A. (2004). *Does job insecurity affect household consumption?*, Working Paper No. 220, Structural Economic Analysis Division, Bank of England.

Bovi, M. (2009). "Economic versus psychological forecasting. Evidence from consumer confidence surveys." *Journal of Economic Psychology* 30: 563-574.

Brunnermeier, M. and J. Parker (2005). "Optimal Expectations", *American Economic Review* 95(4): 1092-1118.

Bryson, A., L. Cappellari and C. Lucifora (2004). *Do Job Security Guarantees Work?*, London School of Economics, Centre for Economic Performance, Discussion Paper 661.

Campbell D, A. A. Carruth, A. P. Dickerson and F. Green (2007). "Job Insecurity and Wages", *Economic Journal* 117 (March): 544-566.

Carroll, C. D., K. E. Dynan and S. D. Krane (2003). "Unemployment risk and precautionary wealth: evidence from households' balance sheets", *Review of Economics and Statistics*, 85, 586-604.

Clark, J. and L. Friesen (2009). "Overconfidence in forecasts of own performance: An experimental study", *Economic Journal* 119 (534): 229-251.

Clarke, A. E. and F. Postel-Vinay (2004). *Job Security and Job Protection*, DELTA, Working Paper No. 2004-16, Paris.

Constans, J. I. (2001). "Worry propensity and the perception of risk", *Behaviour Research and Therapy* 39: 721-729.

Das, M. and A. van Soest (1997). "Expected and realized income changes: Evidence from the Dutch socio-economic panel." *Journal of Economic Behavior & Organization* 32: 137-154.

Das, M. and A. van Soest (1999). "A panel data model for subjective information on household income growth." *Journal of Economic Behavior & Organization* 40: 409-426.

Di Tella, R., R. J. MacCulloch and A. J. Oswald (2003). "The macroeconomics of happiness." *Review of Economics and Statistics* 85 (4): 809-827.

Dominitz, J. (1998). "Earnings Expectations, Revisions, and Realizations." *Review of Economics and Statistics* 80 (3): 374-388.

Erev, I. and B. Cohen (1990). "Verbal versus numerical probabilities: efficiency, Biases and the preference paradox", *Organizational Behavior and Human Decision Processes* 45: 1-18.

Glaeser, E. (2004). "Psychology and the Market", *American Economic Review* Papers and Proceedings 94(2): 408-413.

Green, F. (2006). *Demanding Work. The Paradox of Job Quality in the Affluent Economy*. Woodstock, Princeton University Press.

Green, F. (2009). "Subjective Employment Insecurity Around The World", *Cambridge Journal of Regions, Economy and Society* 2 (3, forthcoming).

Green, F., B. Burchell and A. Felstead (2000). “Job insecurity and the difficulty of regaining employment: an empirical study of unemployment expectations”, *Oxford Bulletin of Economics and Statistics* 62 (December): 855-884.

Hagle T. M. and G. E. Mitchell (1992). “Good-of-fit measures for Probit and Logit”, *American Journal of Political Science* 36: 762-784

Haisken-DeNew, J. P. and M. Hahn (2006). "PanelWhiz: A Flexible Modularized Stata Interface for Accessing Large Scale Panel Data Sets", mimeo, http://www.panelwhiz.eu

Hamermesh, D. S. (1985). "Expectations, Life Expectancy, and Economic Behavior." *Quarterly Journal of Economics* 100 (2): 389-408.

Hurd, M.D. and K. McGarry (2002). “The Predictive Validity of Subjective Probabilities of Survival”, *Economic Journal* 112(482 October): 966-987.

Lehto, A.-M. and H. Sutela (2009). *Three decades of working conditions. Findings of Finnish Quality of Work Life Surveys 1977-2008.* Helsinki, Statistics Finland.

Linz, S. J. and A. Semykina (2008). “How do workers fare during transition? Perceptions of job insecurity among Russian workers, 1995-2004”, *Labour Economics* 15(3): 442-458.

Lukasiewicz E., C. Fischler, M. Setbon and A. Flahault (2001). “Comparison of three scales to assess health risk perception”, *Revue D’Epidemiologie Et De Sante Publique* 49 (4): 377-385.

Lusardi, A. (1998). “On the importance of the precautionary saving motive”, *American Economic Review*, Papers and Proceedings 88: 449-453.

Manski, C. F. (2004). “Measuring Expectations.” *Econometrica* 72(5): 1329-1376.

Manski, C.F. and J. D. Straub (2000). “Worker Perceptions of Job Insecurity in the Mid-1990s”, *Journal of Human Resources* 35 (3): 447-479.

McFadden D. (1973). “Conditional Logit Analysis of Qualitative Choice Behavior", in P. Zarembka (ed.), *Frontiers in Econometrics*, 105-142, Academic Press, New York.

McGuinness, S. and M. Wooden (2009). "Overskilling, Job Insecurity and Career Mobility." *Industrial Relations* 48 (2): 265-286.

McKelvey, R., and W. Zavoina (1975). “A Statistical Model for the Analysis of Ordinal Level Dependent Variables”, *Journal of Mathematical Sociology* 4: 103-120.

Rutter, D. R., L. Quine and I. P. Albery (1998). “Perceptions of risk in motorcyclists: Unrealistic optimism, relative realism and predictions of behaviour”, *British Journal of Psychology* 89: pp.681-696.

Schmidt, S. R. (1999). “Long-Run Trends in Workers’ Beliefs about Their Own Job Security: Evidence from the General Social Survey”, *Journal of Labour Economics* 17 (4), Part 2: S127-S141.

Smith, V. K., D. H. Taylor and F. A. Sloan (2001). "Longevity Expectations and Death: Can People Predict Their Own Demise?" *American Economic Review* 91 (4): 1126-1134.

Stephens, M. Jr. (2004). “Job loss expectations, realizations and household consumption behaviour”, *Review of Economics and Statistics* 86(1): 253-269.

Van den Steen, E. (2004). “Rational Overoptimism (and Other Biases)”, *American Economic Review* 94(4): 1141-1151.

Veall, M. R. and K. F. Zimmermann (1996). “Pseudo-R^2 Measures for Some Common Limited Dependent Variable Models”, *Journal of Economic Surveys* 10(3): 241-259.

Weinstein, N. D. (1980). "Unrealistic Optimism About Future Life Events." *Journal of Personality and Social Psychology* 39 (5): 806-820.

Weinstein, N. D. (1984). "Why It Won't Happen to Me: Perceptions of Risk Factors and Susceptibility." *Health Psychology* 3 (5): 431-457.

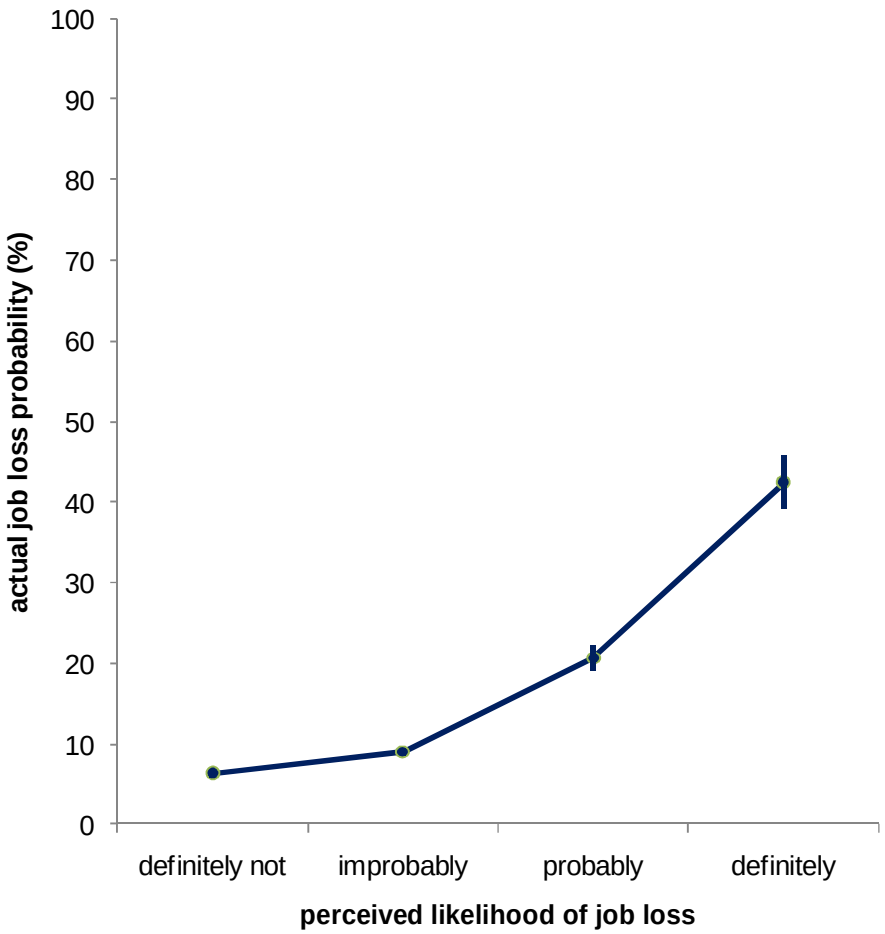
Weinstein N. D., S. E. Marcus and R. P. Moser (2005). “Smokers' unrealistic optimism about their risk”, *Tobacco Control* 14 (1): 55-59.

Wichert, I. (2002). Job insecurity and work intensification: the effects on health and well-being. *Job Insecurity And Work Intensification*. B. Burchell, D. Ladipo and F. Wilkinson, London and New York, Routledge.

Windmeijer F. A. G. (1995). “Goodness-of-fit measures in Binary Choice Models” *Econometric Reviews* 14: 101-116.

Figure 1

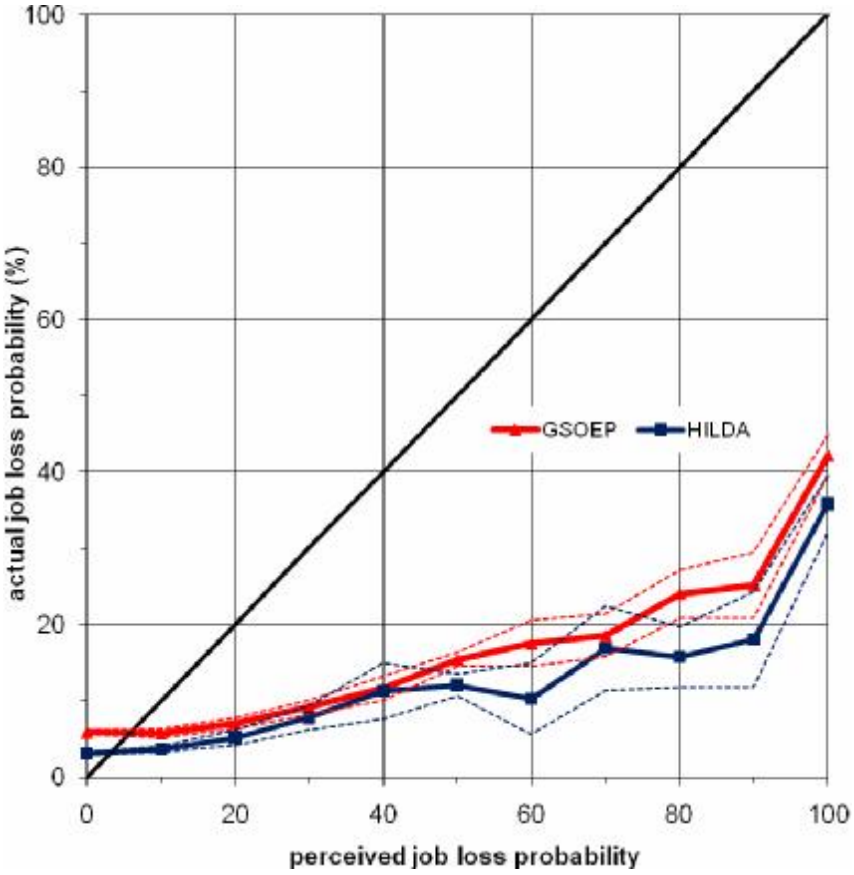
Perceived and actual probability of job loss – Germany – ordinal scale



Notes to Figure 1:
1. The job loss propensities together with their 95% confidence bands are shown against the ordinal scale perceptions for the GSOEP data.

Figure 2

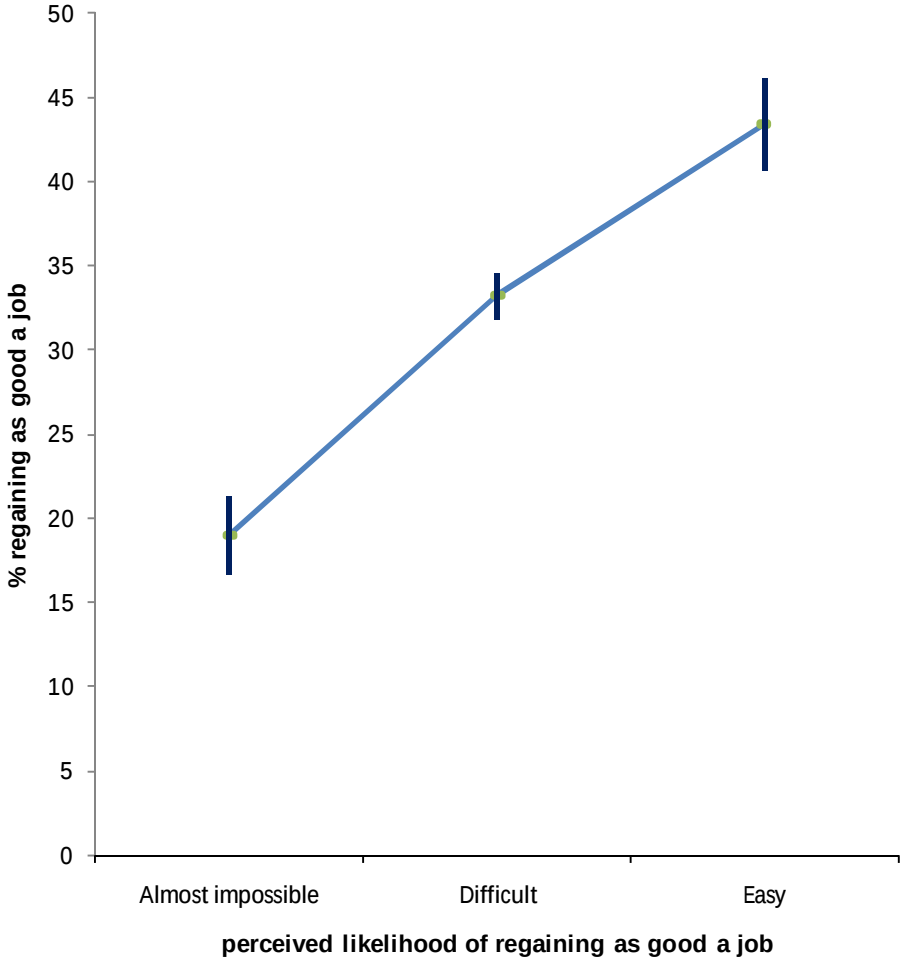
Perceived and actual probability of job loss – Germany and Australia – cardinal scale



Notes to Figure 2:
1. The job loss propensities are shown together with their 95% confidence bands against the cardinal scale perceptions for the GSOEP and HILDA data.
2. The 45^{o} line corresponds to perfect perceptions.

Figure 3

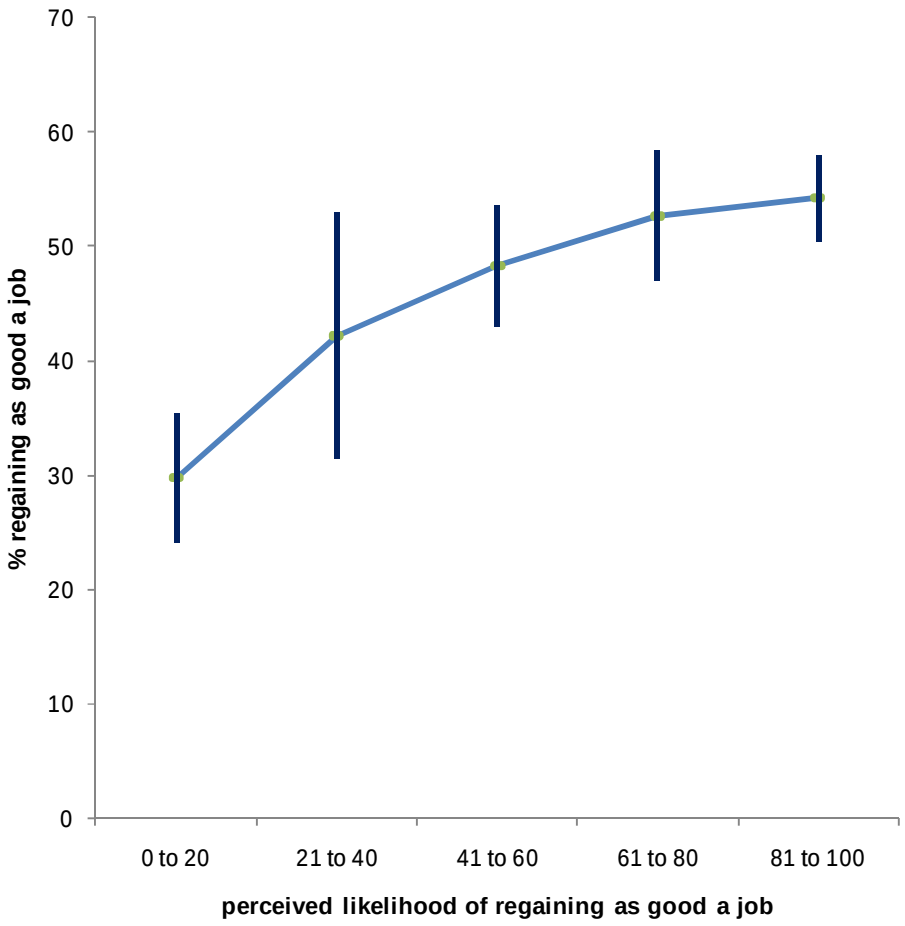
Perceived and actual probability of regaining as good a job – Germany



Notes to Figure 3:
1. The re-employment rates are shown together with their 95% confidence bands against the ordinal scale perceptions for the GSOEP data.

Figure 4

Perceived and actual probability of regaining as good a job – Australia



Notes to Figure 4:
1. The re-employment rates are shown together with their 95% confidence bands against the banded cardinal scale perceptions for the HILDA data.

Table 1

Predicting Job Loss in Germany, using Ordinal Response Scale for Job Loss Expectations

Estimator:	(1) Pooled	(2) RE	(3) FE	(4) Pooled	(5) RE	(6) FE
Panel A: Discrete ordinal response scale						
Perceived prob of job loss (ref: Definitely not):						
Probably not	0.374 (0.050)***	0.388 (0.059)***	0.045 (0.084)	0.321 (0.050)***	0.341 (0.059)***	0.051 (0.087)
Probably	1.345 (0.062)***	1.509 (0.081)***	0.755 (0.116)***	1.210 (0.065)***	1.387 (0.081)***	0.838 (0.121)***
Definitely	2.382 (0.080)***	2.876 (0.112)***	1.842 (0.167)***	2.250 (0.085)***	2.738 (0.114)***	2.062 (0.179)***
Controls:						
Gender male	-	-	-	0.047 (0.041)	0.036 (0.054)	-
Age	-	-	-	-0.040 (0.011)***	-0.056 (0.015)***	-0.217 (0.051)***
Age squared /1000	-	-	-	0.495 (0.137)***	0.711 (0.181)***	4.051 (0.640)***
Graduate or equivalent	-	-	-	-0.129 (0.050)***	-0.158 (0.066)**	0.667 (0.314)**
Unemployment spell in last year	-	-	-	0.725 (0.064)***	0.474 (0.081)***	-0.952 (0.104)***
Private sector	-	-	-	0.566 (0.056)***	0.661 (0.069)***	0.145 (0.132)
20 or more at workplace	-	-	-	-0.213 (0.042)***	-0.224 (0.053)***	0.058 (0.090)
Temporary employment	-	-	-	0.199 (0.067)***	0.183 (0.082)**	-0.312*** (0.122)
Constant	-2.688 (0.041)***	-3.415 (0.067)***	-	-2.304 (0.216)***	-2.657 (0.283)***	-
Hausman test			$\chi^2(3)=110$			$\chi^2(10)=659$
Log likelihood	-9439	-9191	-1958	-9246	-9075	-1861
AIC	18887	18391	3921	18517	18176	3742
BIC	18920	18433	3941	18617	18285	3808
Observations	30,430	30,430	5,625	30,430	30,430	5,625
Individuals		11,815	1,790		11,815	1,790

Notes to Table 1:

1. The base category for the perceived probability of job loss is 'Definitely not'.
2. These are logit estimates in each column. The Hausman test reported at the bottom of column (3) and column (6) rejects RE over FE in both cases.
3. Coefficients estimated to be statistically significantly different from zero are denoted *, ** and *** for 10%, 5% and 1% respectively.

Table 2

Predicting Job Loss in Germany, using Cardinal Response Scale for Job Loss Expectations

Estimator:	(1) Pooled	(2) RE	(3) FE	(4) Pooled	(5) RE	(6) FE
PANEL A: Discrete cardinal response scale						
Perceived prob of job loss (ref: zero):						
10%	-0.026 (0.067)	0.001 (0.075)	0.102 (0.108)	-0.062 (0.069)	-0.043 (0.073)	0.136 (0.109)
20%	0.198 (0.062)***	0.230 (0.070)***	0.148 (0.099)	0.163 (0.064)***	0.184 (0.068)**	0.180 (0.101)*
30%	0.478 (0.066)***	0.554 (0.076)***	0.386 (0.108)***	0.395 (0.067)***	0.436 (0.073)***	0.422 (0.110)***
40%	0.742 (0.084)***	0.831 (0.098)***	0.512 (0.135)***	0.593 (0.086)***	0.647 (0.095)***	0.613 (0.138)***
50%	1.066 (0.048)***	1.162 (0.058)***	0.567 (0.087)***	0.819 (0.051)***	0.879 (0.056)***	0.635 (0.090)***
60%	1.218 (0.110)***	1.347 (0.132)***	0.858 (0.181)***	1.102 (0.114)***	1.091 (0.127)***	0.875 (0.185)***
70%	1.290 (0.099)***	1.449 (0.120)***	0.973 (0.168)***	1.041 (0.103)***	1.133 (0.115)***	0.986 (0.172)***
80%	1.619 (0.093)***	1.838 (0.116)***	1.267 (0.164)***	1.340 (0.097)***	1.476 (0.110)***	1.336 (0.168)***
90%	1.679 (0.121)***	1.934 (0.150)***	1.404 (0.203)***	1.392 (0.126)***	1.537 (0.143)***	1.411 (0.206)***
100%	2.451 (0.064)***	2.837 (0.085)***	1.806 (0.127)***	1.841 (0.073)***	2.065 (0.083)***	1.815 (0.132)***
Controls:						
Gender male	-	-	-	0.078 (0.035)**	0.083 (0.040)**	-
Age	-	-	-	-0.055 (0.009)***	-0.068 (0.010)***	-0.297 (0.043)***
Age squared /1000	-	-	-	0.583 (0.109)***	0.723 (0.124)***	3.760 (0.537)***
Graduate or equivalent	-	-	-	-0.128 (0.042)***	-0.164 (0.048)***	-0.445 (0.169)***
Unemployment spell in last year	-	-	-	0.819 (0.052)***	0.755 (0.059)***	-0.626 (0.087)***
Private sector	-	-	-	0.575 (0.052)***	0.614 (0.057)***	0.041 (0.116)
20 or more at workplace	-	-	-	-0.300 (0.036)***	-0.315 (0.040)***	-0.077 (0.073)
Temporary employment	-	-	-	0.828 (0.050)***	0.886 (0.056)***	0.253 (0.088)***
Constant	-2.767 (0.031)***	-3.329 (0.053)***	-	-1.990 (0.185)***	-2.086 (0.210)**	-
AIC BIC	25669 25764	25338 25442	4966 5035	24367 24532	24252 24425	4842 4959
Hausman test Log likelihood	 -12823	 -12657	$\chi^2(10)=211$ -2473	 -12164	 -12106	$\chi^2(17)=722$ -2404

Table 2 (continued)

Estimator:	(1) Pooled	(2) RE	(3) FE	(4) Pooled	(5) RE	(6) FE
PANEL B: Continuous cardinal response scale						
Perceived prob of job loss (%)	0.023 (0.001)***	0.026 (0.001)***	0.017 (0.001)***	0.018 (0.001)***	0.020 (0.001)***	0.017 (0.001)***
Controls:	NO	NO	NO	YES	YES	YES
AIC	25716	25381	4965	24375	24261	4835
BIC	25733	25407	4972	24462	24356	4891
Hausman test			$\chi^2(1)=177$			$\chi^2(8)=711$
Log likelihood	-12856	-12687	-2481	-12177	-12119	-2410
Observations	43,207	43,207	7,307	43,207	43,207	7,307
Individuals		18,035	2,522		18,035	2,522

Notes to Table 2:

1. These are logit estimates in each column. The Hausman test reported at the bottom of column (3) and column (6) rejects RE over FE in both cases for both Panel A and Panel B.
2. Coefficients estimated to be statistically significantly different from zero are denoted *, ** and *** for 10%, 5% and 1% respectively.

Table 3

Predicting Job Loss in Australia, using Cardinal Response Scale for Job Loss Expectations

Estimator:	(1) Pooled	(2) RE	(3) FE	(4) Pooled	(5) RE	(6) FE
PANEL A: Discrete cardinal response scale						
Perceived prob of job loss (ref: 0 to 4%):						
5 to 14%	0.195 (0.079)*	0.195 (0.085)*	0.066 (0.112)	0.086 (0.081)	0.091 (0.084)	0.091 (0.112)
15 to 24%	0.555 (0.114)**	0.580 (0.122)**	0.441 (0.151)**	0.367 (0.116)**	0.391 (0.121)**	0.416 (0.151)**
25 to 34%	0.987 (0.123)**	1.035 (0.135)**	0.804 (0.168)**	0.802 (0.125)**	0.842 (0.132)**	0.789 (0.170)**
35 to 44%	1.400 (0.189)**	1.466 (0.211)**	1.056 (0.275)**	1.202 (0.193)**	1.264 (0.206)**	1.085 (0.276)**
45 to 54%	1.460 (0.078)**	1.530 (0.088)**	1.044 (0.118)**	1.232 (0.080)**	1.284 (0.086)**	1.014 (0.121)**
55 to 64%	1.291 (0.267)**	1.356 (0.295)**	1.059 (0.372)**	1.097 (0.273)**	1.149 (0.288)**	0.976 (0.375)**
65 to 74%	1.870 (0.204)**	2.000 (0.234)**	1.489 (0.293)**	1.620 (0.211)**	1.710 (0.227)**	1.385 (0.296)**
75 to 84%	1.766 (0.159)**	1.922 (0.181)**	1.610 (0.230)**	1.538 (0.164)**	1.649 (0.176)**	1.542 (0.232)**
85 to 94%	1.907 (0.219)**	2.036 (0.253)**	1.566 (0.335)**	1.727 (0.225)**	1.825 (0.243)**	1.507 (0.336)**
95 to 100%	2.872 (0.093)**	3.116 (0.114)**	2.241 (0.154)**	2.674 (0.098)**	2.823 (0.110)**	2.176 (0.157)**
Controls:						
Gender male	-	-	-	0.290 (0.054)**	0.289 (0.059)**	-
Age	-	-	-	-0.026 (0.011)*	-0.032 (0.012)**	-0.142 (0.064)*
Age sq/1000	-	-	-	0.300 (0.144)*	0.369 (0.158)*	1.103 (0.816)
Graduate	-	-	-	-0.005 (0.068)	-0.008 (0.074)	0.296 (0.318)
Unemployment spell in last year	-	-	-	0.684 (0.070)**	0.629 (0.075)**	-0.332 (0.100)**
Private Sector	-	-	-	0.640 (0.078)**	0.657 (0.083)**	0.029 (0.146)
20 or more at workplace	-	-	-	-0.358 (0.054)**	-0.378 (0.057)**	-0.261 (0.089)**
Casual contract	-	-	-	0.685 (0.062)**	0.706 (0.066)**	0.370 (0.101)**
Fix-Term contract	-	-	-	0.644 (0.083)**	0.657 (0.088)**	0.293 (0.126)*
Constant	-3.453 (0.039)**	-3.916 (0.061)**	-	-3.700 (0.227)**	-3.858 (0.248)**	-
AIC BIC	12472 12565	12355 12456	3327 3393	11912 12081	11874 12052	3297 3415
Hausman test Log likelihood	 -6225	 -6166	$\chi^2(10)=93$ -1654	 -5936	 -5916	$\chi^2(18)=372$ -1630

Table 3 (continued)

Estimator:	(1) Pooled	(2) RE	(3) FE	(4) Pooled	(5) RE	(6) FE
PANEL B: Continuous cardinal response scale						
Perceived prob of job loss (%)	0.028 (0.001)**	0.030 (0.001)**	0.022 (0.001)**	0.025 (0.001)**	0.026 (0.001)**	0.021 (0.001)**
Controls:	NO	NO	NO	YES	YES	YES
AIC	12475	12353	3313	11915	11876	3283
BIC	12491	12379	3320	12008	11977	3342
Hausman test			$\chi^2(1)=79$			$\chi^2(9)=355$
Log likelihood	-6235	-6174	-1656	-5947	-5926	-1633
Observations	34,622	34,622	5,329	34,622	34,622	5,329
Individuals		9,570	1,229		9,570	1,229

Notes to Table 3:

1. These are logit estimates in each column. The Hausman test reported at the bottom of column (3) and column (6) rejects RE over FE in both cases for both Panel A and Panel B.
2. Coefficients estimated to be statistically significantly different from zero are denoted *, ** and *** for 10%, 5% and 1% respectively.

Table 4

Comparing the Ordinal and Cardinal Response scales

GSOEP	Goodness of fit:				
Scale:	Pseudo-R^2	M&Z-R^2	AIC	BIC	N
Ordinal scale – discrete	0.073	0.108	18517	18616	30,040
Cardinal scale – discrete	0.117	0.168	24367	24532	43,207
Cardinal scale – continuous	0.116	0.170	24375	24462	43,207
Individuals in both 1998 & 1999:					
Ordinal scale – discrete	0.038	0.071	4136	4218	6,696
Cardinal scale – discrete	0.062	0.104	4121	4251	6,696
Cardinal scale – continuous	0.060	0.103	4116	4184	6,696
HILDA	Goodness of fit				
Scale:	Pseudo-R^2	M&Z R^2	AIC	BIC	N
Cardinal scale – discrete	0.081	0.092	12472	12565	34,622
Cardinal scale – continuous	0.079	0.089	12475	12491	34,622

Notes to Table 4:

1. The table reports the goodness-of-fit measures for the logit regressions of actual job loss on perceived job loss for the GSOEP data for the years indicated in the first column. All of the control variables in Table 2 and Table 3 are also included.
2. Pseudo-R^2 is the commonly reported McFadden (1973) measure based on the log likelihoods; M&Z-R^2 is due to McKelvey and Zavoina (1975) (see text for details).

Table 5

Predicting finding a new job as good as the current one in Germany

Estimator:	(1) Pooled	(2) RE	(3) Pooled	(4) RE
PANEL A: Discrete cardinal response scale				
Perceived prob of finding as good a job (ref: Almost impossible):				
Easy	1.186 (0.095)***	1.289 (0.108)***	0.623 (0.105)***	0.663 (0.113)***
Difficult	0.755 (0.084)***	0.817 (0.093)***	0.324 (0.092)***	0.342 (0.098)***
Controls:	NO	NO	YES	YES
AIC BIC	8025 8045	8012 8039	7752 7827	7747 7828
Log likelihood	-4009	-4002	-3865	-3862
Observations Individuals	6,462	6,462 5,011	6,462	6,462 5,011

Notes to Table 5:

1. These are logit estimates in each column.
2. Controls included are the same as for Table 2.
3. Coefficients estimated to be statistically significantly different from zero are denoted *, ** and *** for 10%, 5% and 1% respectively.

Table 6

Predicting finding a new job as good as the current one in Australia

Estimator:	(1) Pooled	(2) RE	(3) Pooled	(4) RE
PANEL A: Discrete cardinal response scale				
Perceived prob of finding as good a job (ref: 0 to 20%):				
21 to 40%	0.543 (0.262)*	0.547 (0.264)*	0.430 (0.266)	0.433 (0.269)
41 to 60%	0.790 (0.175)**	0.796 (0.176)**	0.633 (0.179)**	0.638 (0.181)**
61 to 80%	0.965 (0.180)**	0.976 (0.182)**	0.741 (0.186)**	0.749 (0.188)**
81 to 100%	1.027 (0.158)**	1.038 (0.160)**	0.817 (0.164)**	0.826 (0.166)**
Controls:	NO	NO	YES	YES
AIC BIC	2261 2288	2264 2296	2239 2315	2242 2323
Log likelihood	-1125	-1126	-1106	-1106
PANEL B: Continuous cardinal response scale				
Perceived prob of finding as good a job (%)	1.052 (0.156)**	1.065 (0.158)**	0.835 (0.163)**	0.845 (0.165)**
Controls:	NO	NO	YES	YES
AIC BIC	2257 2267	2259 2276	2234 2293	2237 2302
Log likelihood	-1126	-1127	-1106	-1106
Observations Individuals	1,660	1,660 1,438	1,660	1,660 1,438

Notes to Table 6:

1. These are logit estimates in each column.
2. Controls included are the same as for Table 3.
3. Coefficients estimated to be statistically significantly different from zero are denoted *, ** and *** for 10%, 5% and 1% respectively.

APPENDIX

Table A1

Proportions of employees losing their job by perceived likelihood of job loss in Germany

Ordinal/category scale (1993, 1994, 1996 and 1998)		
Perceived likelihood of job loss:	Actual Job Loss (%)	(s.e.)
Definitely not	6.4	(0.2)
Probably not	9.0	(0.2)
Probably	20.7	(0.8)
Definitely	42.4	(1.7)

Cardinal/numerical scale (1999, 2001, 2003 and 2005)		
Perceived likelihood of job loss:	Actual Job Loss (%)	(s.e.)
0%	5.9	(0.2)
10%	5.8	(0.3)
20%	7.1	(0.4)
30%	9.2	(0.5)
40%	11.7	(0.8)
50%	15.4	(0.5)
60%	17.5	(1.5)
70%	18.6	(1.4)
80%	24.1	(1.6)
90%	25.2	(2.2)
100%	42.2	(1.4)

Notes to Table A1:

1. Time frame for perceived likelihood of job loss question and actual job loss experienced is two years for both ordinal (category) and cardinal (numerical) scales.
2. The perceptions of job loss question is asked approximately every two years as indicated by the survey years shown at the top of each panel.
3. Since 1999, respondents have been asked the perceived likelihood of job loss on a discrete 0 to 100 scale at decile intervals, and are told that 0 means certain not to happen, while 100 means certain to happen.
4. Standard errors (s.e.) are in parentheses.

Summary statistics

Ordinal scale (1993, 1994, 1996 and 1998):
Mean (s.e.) proportion experiencing job loss (%): 10.1 (0.17)
Number of observations: 30,430

Cardinal scale (1999, 2001, 2003 and 2005):
Mean (s.e.) proportion experiencing job loss (%): 9.72 (0.14)
Mean (s.e.) perceived likelihood of job loss (%): 21.4 (0.13)
Number of observations: 43,207

Table A2

Proportions of employees losing their job by perceived likelihood of job loss in Australia

Perceived likelihood of job loss:	Actual Job Loss (%)	(s.e.)
0 to 4%	3.1	(0.1)
5 to 14%	3.7	(0.2)
15 to 24%	5.2	(0.5)
25 to 34%	7.8	(0.8)
35 to 44%	11.4	(1.9)
45 to 54%	12.0	(0.7)
55 to 64%	10.3	(2.5)
65 to 74%	17.0	(2.8)
75 to 84%	15.6	(2.0)
85 to 94%	17.6	(3.1)
95 to 100%	35.9	(1.9)

Notes to Table A2:

1. Time frame for perceived likelihood of job loss question and actual job loss experienced is one year.
2. Standard errors (s.e.) are in parentheses.

Summary statistics:

Mean (s.e.) proportion experiencing job loss (%):	4.9 (0.12)
Mean (s.e.) perceived likelihood job of loss (%):	10.1 (0.11)
Number of observations:	34,662

Table A3

Proportions of Job-Losing Employees Who Find a New Job As Good As The Current One in Germany, by Perceived Employability

Perceived likelihood of regaining a job as good as the current one (%):	*Percentage regaining a job as good as the current one:* (%)	(s.e.)
Easy	43.4	1.4
Difficult	33.2	0.7
Almost impossible	19.0	1.2

Notes to Table A3:
1. Time frame for finding a new job is one year.
2. Standard errors (s.e.) are in parentheses.

Summary statistics

Among all job-losing employees (n = 6,462):
Mean (s.e.) proportion regaining a job as good as the current one (%): 32.9 (0.6)

Table A4

Proportions of Job-Losing Employees Who Find a New Job As Good As The Current One in Australia, by Perceived Employability

Perceived likelihood of regaining a job as good as the current one (%):	*Percentage regaining a job as good as the current one:* (%)	(s.e.)
0 to 20%	29.8	2.9
21 to 40%	42.2	5.5
41 to 60%	48.3	2.7
61 to 80%	52.7	2.9
81 to 100%	54.2	1.9

Notes to Table A4:
1. Time frame for finding a new job is one year.
2. Standard errors (s.e.) are in parentheses.

Summary statistics

Among all job-losing employees (n = 1,660):
Mean (s.e.) proportion regaining a job as good as the current one (%): 48.4 (1.2)
Mean (s.e.) perceived likelihood of regaining as good a job (%): 67.1 (0.8)