Do employees really gain from strong employment protection? Workplace stress and labor market institutions.*

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Abstract

This paper explores the link between the rigidity of employment protection and work-related stress. Theoretical reasoning suggests a positive correlation: in the same way that a costly divorce exacerbates family tensions, costly separations reinforce the extent to which workers and employers engage in conflict. Separation costs also induce firms to use monitoring in order to increase pressure on workers, as well as reduce the latter's propensity to quit by reducing labour market turnover, thereby increasing job dissatisfaction.

Data from Canada's National Public Health Survey, which provides details on work-related stress and the consumption of psychoactive medications such as anti-depressants, support the conjecture. By first exploiting cross-province differences in employment protection legislation (EPL), I find positive links between individual employment protection and some dimensions of stress, and weaker but positive links between employment protection, depression and the consumption of various psychoactive drugs. I then use tenure and firm size information from another dataset to generate further variance in EPL within regions, by imputation. They confirm the previous results. Falsification exercises indicate that family stress, for example, is unrelated to regional EPL, while financial stress is negatively correlated with EPL.

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Is employment protection legislation (EPL) a good device for increasing workers' wellbeing? It is known from research in labour economics that the answer is often negative. All else being equal, employment protection increases job duration and might therefore be beneficial to currently employed workers. However, it is also well established that EPL reduces job hiring. That is, it fails to increase the wellbeing of outsiders, i.e. non-employed workers and workers not covered by EPL, including those under probationary periods, temporary workers and part-timers.[1] Employment protection also protects specific human capital investments and secure workers: it can be a substitute for private insurance against layoffs in a world of imperfect insurance markets, given the numerous moral hazard problems.

It may however also have unexpected adverse effects: in the same way that divorce costs may force couples to stay together in spite of chronic conflicts, employment protection may exacerbate strain and tension within firms. The most obvious example is the case of an economically non-viable job: firms may pressure workers to quit and thus save on layoff costs. In extreme cases, firms may induce quitting by decreasing the quality of work environments and, in extreme cases, harassing workers. But even in a productive job, firms may react to high layoff taxes by adjusting monitoring methods, routines, workplace organization and management techniques in a way unfavourable to workers' wellbeing. None of these aspects is particularly gratifying for workers, resulting in increased stress and job dissatisfaction.

One way to measure workers' wellbeing is to consider workplace stress indicators. An examination of the cross-country correlation between stress and EPL, as measured in two different international datasets (the European Quality of Life Survey and the International Social Survey Program, see Figure 1a&b) reveals a surprisingly strong and positive correlation between stress markers and the degree of OECD-measured employment protection. This correlation does not imply any causal link, since several country-specific factors may impact both variables. In Lepage-Saucier and Wasmer (2008), we use precisely these two datasets over several years in order to provide more causal evidence. However, country-specific factors aside, a number of difficulties arise: one of them being that psychological factors such as stress are difficult to measure.

In this paper, I seek to remedy to this difficulty by using original features from a very detailed Canadian dataset (the National Population Health Survey, or NPHS), which covers a representative sample of the Canadian population, about 17 000 individuals, interviewed throughout 5 cycles of two years each, between 1994-1995 and 2002-2003. Given cross-regional differences in employment legislation, one finds, again, a positive unconditional correlation between stress and employment protection.

Beyond correlations and using many additional variables, the paper shows numerous regressions with the same sign, and builds falsification exercises and counterfactuals with which to assess the causal effect of stress on employment. First, I find that stress at work resulting from conflicting demands is positively associated with individual employment protection. The same is true regarding stress emanating from relations among co-workers and with management: it is positively associated with protection against individual dismissal, and also with protection against collective layoffs. Quantitatively, in the employed workers cross-section, up to one standard deviation of stress, emanating from conflicting demands or from relations among co-workers and with supervisors, can be explained by EPL were it to be raised from the lowest to the highest regional value.

[1] e.g. see Lazear (1990), Burda (1992), Mortensen and Pissarides (1999), Kugler and Saint-Paul (2004) and Autor et al. (2006).

The results are corroborated by a number of additional regressions. I find that the effect of individual employment protection (that is, against individual layoffs) is positive and larger than that of collective employment protection (against mass layoffs), as our bullying theory suggests. I also find that a sub-dimension of stress at work, namely stress from losing one's job, is actually reduced by EPL.

Adding up all dimensions of work-related stress, the net effect on total stress at work is also positively associated with individual EPL. The overall effects are smaller, but significant nonetheless. Quantitatively, a shift of individual EPL from the lowest to the highest regional value is associated with a roughly 15% standard deviation of total stress. This fraction reaches 20% if one adds up the effect of employment protection against mass layoffs. The effect is smaller than for specific components of workplace stress because it is mitigated by the negative effect on stress provoked by the threat of job loss.

Note that Canada's NHPS contains a large — and unique compared to traditional labour force surveys — selection of useful control variables capturing various psychological factors, notably the ability to cope with or over-report stress (e.g. childhood trauma). I match NPHS data with 1996 and 2001 Census data in order to obtain a precise measure of local labour market conditions at the county level (the Census's geographical division). This allows for investigation into whether higher local unemployment affects the wellbeing of workers beyond EPL.

Falsification exercises are provided: family and financial stress are either unrelated or negatively related to regional employment protection. Beyond stress, I use questions on drug consumption habits (including anti-depressants, tranquilizers, and sleeping pills[2]), as well as potentially stress-related health questions such as blood pressure and, ultimately, depression: objective measurements of depression are in principle more reliable than subjective variables (stress) with the usual caveats (Hamermesh 2004). Positive links between EPL and such variables are also present in the data.

Alternative identification strategies, such as diff-in-diff approaches, for example, that are obtained from variations across comparable geographical units and time-variations, such as those used by Autor et al. (2006) or Kugler and Saint-Paul (2004) in the United States, would provide a very useful confirmation of the intuitions contained in this paper. However, since US data on work-related stress covering the relevant period are difficult to come by, replicating these strategies is this research agenda's next step, namely to explore relations holding between stress, wellbeing and employment protection. The paper's first stage is still useful, in that it emphasizes a few perhaps unexpected but only superficially paradoxical facts.

One of this paper's conclusions is that the quality of labour relations is adversely affected by labour regulation. This confirms the importance of industrial relations and, further, of trust in the social relationships between unions and employers, as was recently emphasized by Blanchard and Philippon (2004, 2006). Our paper suggests that EPL does generate individual conflicts and poor industrial relations, which explains the relative stability of the poor quality of labour relations in Europe. This is also consistent with the recent improvements in British industrial relations, as indicated by Blanchard and Philippon (2004, page 24), following the experience of Thatcherite deregulation in the 1980s. Another of this paper's lessons pertains to the need to understand and generalize other results regarding EPL's paradoxically adverse consequences: recently, Postel-Vinay and Saint-Martin (2005), Clark and Postel-Vinay (2004), and Deloffre

[2] As noted in a number of medical as well as economic studies, sleep problems may result from highly tense working environment. For instance, Akerstedt et al. (2002) find that in "disturbed sleep" logistic regression, the odd ratio (OR) of "high work demand" is 2.15. "Inability to stop thinking about work" results in an OR of 3.20.

and Rioux (2004) have documented, using the European Community Panel survey, a strong negative link between perceived job security and employment protection. The NPHS data used here contain a specific question on how respondents perceive the risk of losing their job and the stress this perceived risk provokes. This paper investigates the same question posed by these three papers as a special case.

The paper is organized as follows. Section 1 develops the economics of stress and EPL. Section 2 describes the various Canadian datasets used. Section 3 describes the empirical strategy. Section 4 presents the regression results. Section 5 concludes.

1 Mechanisms

To develop the main theoretical points, let us reduce EPL to the area pertaining to its main economic impact, namely, pure taxes on layoffs. Two potentially important aspects of EPL are thus ignored: redistribution between firm and worker, the impact of which is generally neutral because it is internalized in wages (Lazear 1990, Burda 1992), and the complexity for firms involved in laying off for fault.

Let us summarize here the economic intuitions of EPL's impact when firms are in a position to affect workers' working environments, for better or for worst. A model addressing those questions can be found in the discussion paper version of this article. Broadly speaking, effects fall into two categories, partial equilibrium effects and general equilibrium effects.

In partial equilibrium, the first effect of EPL comes from the fact that firing is a monitoring device (Shapiro and Stiglitz 1984). As laying off becomes increasingly expensive or difficult, managers raise monitoring intensity and psychological pressures, thereby increasing stress. One can group these mechanisms under the label "*intense monitoring effect*". The latter generates a positive link between individual EPL (as opposed to collective EPL, applicable in the event of mass layoffs) and stress.

A second set of mechanisms arises when jobs are non-viable, i.e. in recessions or when a task becomes obsolete. In such cases, an efficient labour market would require firing for economic reasons (no-fault layoff). As this becomes more costly, the firm with one or several redundant workers negatively affects working conditions. It can also try to establish professional faults by raising monitoring intensity and thereby obtaining dismissals at lower cost, which potentially generates further stress. I call this the *"harassment effect"*.

In general equilibrium, EPL reduces labour turnover: it reduces the rate of job separations, resulting in firms opening fewer positions. This lengthens periods of unemployment and possibly raises the quasi-rent associated with holding a job. In terms of stress and wellbeing, this has two consequences. First, the fear of layoff is exacerbated, since workers have more to loose: this is a stress-factor and presumably explains the results of Clark and Postel-Vinay (2004), Postel-Vinay and Saint-Martin (2005) and Deloffre and Rioux (2004). The second effect is the reduction of gains from quitting. As a result, at the margin, employees do not leave firms even when they dislike their jobs, colleagues and managers. This is referred to as the *"mismatch effect"*.

2 Data description

2.1 NPHS individual data

The main database is the National Population Health Survey (NHPS hereafter) and specifically its Household longitudinal component.[3] It consists of 5 cycles: 1994-1995, 1996-1997, 1998-1999, 2000-2001 and finally 2002-2003. It includes 17 276 persons of all ages, with a longitudinal dimension and individual identifiers. The survey is designed to be representative of the cross-section and has a longitudinal follow-up.[4] The target population includes all 1994 residents of Canada, excluding those on Indian Reservations and Crown Lands, in health institutions, Canadian Forces bases and some remote areas in Ontario and Quebec. Northern regions (the Yukon, Nunavut and the Northwest Territories), where population density is low, were excluded from the analysis. I provide in Table A1 of the Appendix the sample composition per province, with a significant number of individuals in each. The attrition problem appears to be relatively limited: 73% of the original sample was interviewed during the five cycles over almost ten years. Attrition includes deaths, and also a significant number of individuals temporarily unavailable during a given cycle but re-interviewed during a subsequent cycle. The database is provided with sample weights computed for each respondent in each cycle of the survey, as well as with various longitudinal weights (for all respondents or full respondents) for each wave following the first wave. I used the latter weight.

I use the following variables because they are consistent throughout the waves: employment status (both in the reference the week and the year preceding that of the survey), the sector of activity (16), occupation (47) and education, age, and the usual demographic information such as marital status or family arrangement. The analysis will be restricted to a sample of respondents between 25 and 64 and excludes retirees and the self-employed. The 15 to 24 year old population is also excluded because it is often employed part-time, there being no available control for part-time employment in the relevant cycles. However, including the 15-24 year old population in regressions does not change the results much.

2.1.1 Stress: questions and specification

The questionnaire has several questions related to stress classified into four broad categories: family stress (partner), family stress (children), work stress, and stress due to financial problems. In particular there are 12 statements specifically related to work stress (denoted hereafter as the base questions), in which the worker must choose one of the following possible answers—1: strongly agree, 2: quite agree; 3 neither agree nor disagree; 4: quite disagree; and 5: strongly disagree.

These statements are as follows:

1. Your job requires that you learn new things. 2. Your job requires a high level of skill. 3. Your job allows you freedom to decide how you do your job. 4. Your job requires that you do things over and over. 5. Your job is very hectic. 6. You are free from conflicting demands that others make. 7. Your job security is good. 8. Your job requires a lot of physical effort. 9. You have a lot to say about what

[3] A detailed description is available at Statistics Canada's website, at http://www.statcan.ca/cgi-bin/imdb/p2SV.pl?Function=getSurvey&SDDS=3225&lang=fr&db=IMDB&dbl=E&adm=8&dis=2

[4] For instance, the death of a longitudinal panel member is "confirmed against the Canadian Vital Statistics Database – Deaths."

happens in your job. 10. You are exposed to hostility or conflict from the people you work with. 11. Your supervisor is helpful in getting the job done. 12. The people you work with are helpful in getting the job done.

There is also a 13^{th} question on job satisfaction: How satisfied are you with your job? where possible answers range from very satisfied to very unsatisfied.

Based on these questions, derived stress questions were constructed independently by a team of sociologists and the derived variables were made available by Statistics Canada to the research community and directly included in the dataset.[5] There are 6 indicators of work stress, a 7th derived stress index (job strain) which is a combination of three of the previous stress indicators, and finally an aggregate stress index built by the team, which adds up all six of the first dimensions of stress.[6]

These "stress variables" are described as follows in the Manual:

- Skill Requirements: (0-12) (lower values means that higher skills are required for the job). This derived variable determines the respondent's task variety at main job in the past 12 months
- Decision Latitude - Decision Authority: (0-8) (higher values indicate lower decision authority). This derived variable indicates whether the respondent's main job in the past 12 months allows them freedom on how to do their job and if they have a lot of say in what happens on their job.
- Psychological Demands: (0-8) (higher values indicate greater psychological demands). This derived variable indicates if the respondent is free from conflicting demands that others make and if their main job in the past 12 months is very hectic.
- Job Insecurity: (0-4) (higher values indicate greater job insecurity). This derived variable indicates whether the respondent feels that their main job security is good.
- Physical Exertion: (0-4) (higher values indicate greater physical exertion). This derived variable indicates whether the main job in the past 12 months requires a lot of physical effort.
- Social Support: (0-12) (higher values indicate lower social support). This derived variable indicates the social support available to the respondent at his/her main job in the past 12 months. Questions are asked about whether or not the supervisor and the people the respondent worked with were helpful in getting the job done, and whether the respondent was exposed to hostility or conflict from the people they worked with.
- Job Strain: (0.2-5) (higher values indicate greater job strain). This derived variable indicates whether the respondent experiences job strain. Job strain is measured as a ratio of psychological demands and decision latitude which includes skill discretion and decision authority.

[5] This team was lead by Blair Wheaton from the University of Toronto. The full description of the data can be found on pages 122-128 in the Derived Variables Documentation 2004, available at http://www.statcan.ca/english/sdds
/document/3225_D10_T9_V1_E.pdf.

[6] Many of these questions are also available in the two international datasets used in the introduction in charts 1a and 1b (the European Quality of Life Survey and the International Social Survey Program). The methodology is thus considered as relatively standard in quantitative sociology.

- Work Stress Index - All Items: (0-48) (higher values indicate greater work stress). This derived variable determines the respondent's perception about all dimensions of their work.[7]

A final remark is as follows: in the original variables for work-related stress, the units of stress variables are such that a higher number corresponds to higher stress, except in the case of one stress dimension, that "from skill requirement", which is higher the lower the associated number. Since the original "overall stress index "added up all dimensions, I computed an alternative overall stress index by adding all dimensions, with the exception of "Skill requirement", which was subtracted from the total instead.[8]

2.1.2 Depression, anti-depressants and various other factors

Several distress indicators are also available, among which I select those based on objective clinical characteristics of individuals, notably among which, a Depression Scale (0-8) based on 21 questions regarding respondents' psychological and clinical health[9] and a Predicted Probability of Depression (0-1).[10]. There are also a few questions on drugs use. For all respondents above the age of 12, the interviewer asks the following question in regards to about 30 different medications:

In the past month, that is, from [date one month ago] to yesterday, did [you/FNAME] take:

...tranquilizers such as Valium or Ativan? (yes/no)

...anti-depressants such as Prozac, Paxil or Effexor? (yes/no)

...sleeping pills such as Imovane, Nytol or Starnoc? (yes/no)

The exact name of the medication is also reported and respondents are asked to look at the bottle, tube or box. I build dummy variables reflecting the use of such drugs, and also a blood pressure indicator which takes value 1 if respondents are currently suffering from abnormally high blood pressure.

2.2 Firing restrictions

In Canada, employment protection differs across provinces and involves areas such as firing taxes, severance payments, maximum number of days of temporary layoff and finally advance notice. No systematic documentation for most of these areas exists at the provincial level, because they

[7] The longitudinal survey's Manual states that, due to a translation problem, "*In Quarter 3 of Cycle 1 (1994) collection, not all eligible working people were asked the work stress questions in the French interview. This may result in some bias.*" Furthermore, a correction for refusals, included in Cycles 4 and 5, has not been implemented for Cycle 1. For this reason, we will do most regressions with Cycle 4 and 5 only, with simply a comparison with the three cycles included as a robustness check. The implication is that most regressions will be based on two observations per individual, excluding the possibility of efficient fix effect estimators.

[8] This transformation marginally raises the fit and the significance of the regressions with the overall stress index, without strong implication. In any event, the vast majority of the results presented below, in particular the regressions with sub-components of stress, are unaffected by this assumption affecting only the "overall stress index.

[9] The score "assesses the respondent's depression state. The items used to measure depression are based on the work of Kessler and Mroczek (at the University of Michigan). They selected a subset of items from the Composite International Diagnostic Interview (CIDI) that measure major depressive episodes (MDE). The CIDI is a structured diagnostic instrument that was designed to produce diagnoses according to the definitions and criteria of both DSM-III-R and the Diagnostic Criteria for Research of the ICD-10."

[10] Internet Site: National Comorbidity Survey: www.hcp.med.harvard.edu/ncs/. Composite International Diagnostic Interview (CIDI): www.who.int/msa/cidi/index.htm

are often a matter of jurisprudence, with one important exception: advance notice requirements for which no provision existed immediately after World War II were progressively incorporated in regional laws, following courts decisions in specific cases.

Advance notice requirements are an important area of EPL: they reduce employer discretion regarding dismissals; they are often an implicit severance payment in cases where workers are asked to stay at home during the period, and finally they have well-known effects on hiring decisions and labour markets dynamics.[11] Differences across provinces can be seen in Figure A in the Appendix, from a table in Friesen et al. (1997) and Human Resources and Social Development Canada (the Federal labour agency). Advance notice requirements initially reflected the decisions of local courts before being integrated into provincial legislation. Local judges decided that, for a worker with n years of seniority, a p month's notice period was to be imposed on the firm. Differences across provinces therefore reflect the latter's differing philosophies regarding economic layoffs: it is quite likely that other areas of EPL are correlated with the length of advance notice. This will be our working hypothesis, with ex-post checks (see Section 2.2.2).

An interesting feature in light of this paper's purpose is that advance notice has two distinct dimensions in Canada: advance notice in cases of individual layoffs, and advance notice in cases of mass layoffs. The length of notice for individual layoffs depends on workers' seniority. EPL in cases of mass layoff is determined by firm size. Some provinces, such as Alberta or British Columbia, have no provisions for collective layoffs, while others have relatively large provisions, up to 4 months in the largest firms in Quebec, for example. For individual EPL, the total length of the notice period varies across region and either progresses rapidly or remains relatively flat.

Given the available data, there are two distinct strategies for identifying the effects of EPL. The first would use information on seniority and firm size regarding individual workers, comparing individuals within provinces. The second would use regional differences and identify the effect of EPL across provinces. The pros and cons of each procedure are discussed below.

2.2.1 Employment protection legislation in provinces

I first build an aggregate index of regional employment protection for individual dismissals and another index for employment protection for collective dismissals. The aggregation procedure is described in the Technical Appendix (Appendix B). Both dimensions are therefore expressed as the expected number of weeks of advance notice but are meant to proxy more complex dimensions of EPL.

Let us denote these regional EPL indices by EPL_ind and EPL_coll. It is checked ex-post that these variables make sense: as described in Appendix B2, the EPL indicators are positively correlated with regional unemployment duration, as well as with other indicators of employment regulations provided independently by business surveys. The indicators are also negatively associated with the transition probability from employment to unemployment. One can thus be confident that advance notice is a good proxy for other forms of EPL and captures well the fluidity of provincial labour markets.

[11] See e.g. Garibaldi (1998) for theory and some data analysis for OECD countries. For Canada, Friesen (1997) has used the same variations to study the impact of advance notice regional differences on employment duration and found that longer advance notice both raises the fraction of job-to-job moves and reduces the hazard rate.

2.2.2 Imputed EPL and within-province identification

As indicated above, running within-region estimates of the effect of EPL is not directly possible in the absence of information on firm size and seniority of individuals in the NHPS: tenure can be constructed from the NPHS questionnaire only from cycles 1, 2 and 3, whereas stress is available from cycles 4 and 5, that is, 2 and 4 years after the last observation of tenure; moreover, employers' size is unavailable in the NPHS. In addition, these two variables would be very endogenous: individuals subject to stress may not stay long in less protected firms, preferring to work in those with more protection.

One can remedy both problems using an imputation technique, and approximate the degree of protection at the individual level. Another dataset, the Canadian Labour Force Survey (LFS or *Enquête sur la Population Active*, EPA) contains information on seniority and establishment size as well as all relevant information such as industry, occupation and demographics. I used the monthly files for years 1994, 1996, 1998, 2000 and 2002, that is a total of 60 files, containing overall slightly more than 3 million observations, and about 500 000 different individuals (there is a rotating scheme of about 6 months). The dataset contains information on tenure in months and establishment and firm size, as well as a set a variables denoted by Z_{it} common with the NPHS (region, industry, occupation, gender and age).

From the information on tenure and on the region of individuals in EPA-LFS, I built the exact number of weeks of advance notice protecting individuals from individual layoffs thanks to the table in Figure B. Similarly, from information on establishment size, one obtains the exact number of weeks of advance notice in case of mass layoffs. Let us denote these actual measures of EPL by $actEPL\_ind_{it}$ and $actEPL\_coll_{it}$. One then regresses these measures on a set of regional dummies, sectors and occupation, age (5 year bands), education (14 dummies) and gender, weighting the regression by the panel weight of EPA-LFS and correcting for clustering per individual. The imputation models explain about 45% of the total variance for individual EPL and about 28% of total variance for collective EPL. I then used the vector of coefficients to obtain the fitted or imputed values in the NHPS dataset, which is denoted by EPL_fit in tables.[12]

3 Empirical strategy

For a given individual i at time t, the subjective indicators of stress are denoted by Σ_{it}, such as workplace stress; and objective indicators of clinical manifestations of workplace stress are denoted by O_{it}, such as blood pressure, consumption of psychoactive drugs and depression scores.

3.1 Subjective data

Subjective indicators are subject to potential mis-measurement, as self-declared stress may not reflect the true stress of the workplace environment. For this reason, the estimation of an equation such as

$$\Sigma_{it} = \alpha + \beta X_{it} + \delta EPL_{region(it)} + \nu_{it} \quad (1)$$

[12] I also tried an alternative measure where individuals with temporary contracts are assigned a value of 0 for $actEPL$. This would only marginally improves the t-stat in the stress regressions (a t-stat of 3.30 typically becomes 3.32).

in the universe of respondents where ν_{it} is an error term of individual i at time t and X_{it} is a set of personal characteristics, gives rise to two potential problems: first, whether Σ_{it} reflects the characteristics of the job of individual i or rather his or her ability to cope with stress. Second, whether the measurement error in Σ_{it} affects the estimate. Denote by Δ_{it} the 'true' stress generated by the job. True stress differs from reported stress, in the following way:

$$\Sigma_{it} = \Delta_{it} + \phi_{it} + \varepsilon_{it} \tag{2}$$

where ε_{it} is the measurement error in individuals' responses capturing the heterogeneous propensity to declare stress ; ϕ_{it} is the (in-)ability to cope with stress. Both error terms do not affect the estimate of δ to the extent that they are uncorrelated with ν_{it}, which can be solved if we have enough and sufficiently good controls. The controls are described in the next sub-section.

Another potential problem is the selection issue: workers experiencing more stress may be likely i) to quit or ii) to withdraw from the labour market. Item i) is not a problem here since our stress data cover workers having been employed in the year of the survey: even quitters or the non-employed answer the stress questions. Item ii) is not a problem if one decides that the model's relevant sample (its "universe") is the sample of those currently employed: the interest lies in how job characteristics are stressful. Therefore, one is not interested in what could be stressful for nonexistent jobs. In this interpretation, there is no selection issue.

3.2 Controls

As controls, denoted by X_{it}, I shall use: sex, 9 age categories, marital status, household types, living arrangements of selected respondents, urban/rural distinctions, household size, six weight categories, highest levels of education (fourteen dummies), whether individuals have immigrated in the last ten years, whether he or she has immigrated more than ten years ago (based on age at time of immigration), country/area of origin (among areas: Canada, Europe, US, South America, Asia,...), year dummies, 16 sectors and 47 occupations. To control for other characteristics linked to the ability to cope with stress, there are a number of possible variables in this rich dataset. For instance, there is a variable reflecting childhood trauma.[13] There are also variables on the amount of stress experienced in areas other than work, so-called chronic stress[14], which will not be used in benchmark regressions but will be useful in the falsification exercises. The idea is that these additional controls will remove most of the correlation between ϕ_{it} and ν_{it}. See the full list of controls in the regression tables. One way of removing individual heterogeneity would be to rely on fixed effects estimators. However, there is only a tiny fraction of regional movers: fixed effects in equation (1) lead to a considerable loss of efficiency.

A last potential control is union density at the provincial level, which may be used as an additional regressor. The data can be obtained from Statistic Canada. Given a break in the series in 1996, I use an average for 1997-2003 and use that variable in regressions.[15] Unfortunately, the individual's membership status is not available in NHPS.

[13] "This index measures the number of traumatic events respondents have been exposed to during their childhood, adolescence or adulthood. Events included are parental divorce, a lengthy hospital stay, prolonged parental unemployment, frequent parental alcohol or drug use. A higher score indicates more stressors."

[14] The exact definition of chronic stress is: "The stressors include activity overload, financial difficulties and problems with relationships in day-to-day encounters." and the construction of the index does not include the 'W-stress' variables, i.e. stress at work.

[15] From table 279-0025 for 1976-1995: all employees coverage and from table 282-0073 for 1997-2004: full-time employee coverage. Both come from the Labor Force Surveys.

3.3 Objective data

The questionnaire has a section on quantitative measurements of psychological disorders and other interesting health variables. Contrary to the "workplace stress" that is by definition only available to employees, such data are available for the total working-age population. This is an interesting feature of the data since the essence of the test will be to interact employment status with EPL in order to control for regional effects possibly affecting the propensity toward antidepressant consumption or local genetic factors affecting, for example, blood pressure. In that sense, one can estimate an equation such as

$$O_{it} = \alpha + \beta X_{it} + \delta.EPL_{region(it)} * emp_{it} + \gamma.emp_{it} + D_i Region_{it} + \nu_{it} \quad (3)$$

where D_i is a regional fixed effect and $Region_{it}$ is the region of the individual at time t, and emp is a dummy variable indicating that the individual surveyed is currently employed. I will also control for whether the individual is covered by health insurance.

An important concern is that, in OLS regressions, the coefficient γ is always very negatively significant: ceteris paribus, employed individuals have a propensity to cope with stress that is higher than that of non-employed. In other words, depressed individuals, those taking psychoactive drugs and those with severe pathology are less likely to work. One way to express this fact is to assume that there is an employment equation, such as

$$emp^*_{it} = \alpha' + \beta'.Z_{it} + \eta_{it} \quad (4)$$

where the star denotes a latent variable, Z_{it} is a set of variables determining the employment probability and η_{it} is an individual noise, likely to be negatively correlated with ν_{it}. The set of variables Z_{it} contains most of variables in X_{it} (age, gender, family, etc...). As an identification strategy, I chose to add local labour market conditions, such as the unemployment or activity rate in the area corresponding to the sub-division of the Census regarding individuals. Such variables happen to be highly correlated with individual employment status and are not in principle correlated with the individual propensity to suffer from pathology as it is an aggregate over roughly 100 000 individuals and is obtained from a distinct survey. Accordingly, equation (3) will be estimated using IV estimators and an appropriate correction of standard errors.[16]

Appendix A5 discusses several econometric issues linked to individual clustering, regional clustering and the correction of standard errors when EPL is imputed from the LFS survey.

4 Results

4.1 Sample statistics and correlations

Table 1 displays summary statistics in a sample restricted to respondents between the ages of 25 and 64 and who are not self-employed. The share of men is slightly below 0.5; almost 20% is non-native Canadian. The average age is 43.3 years. In the sample, on a trauma scale of (0-7), the average is 1.06 with a standard deviation (s.d.) of 1.23. Almost a quarter of the population is not covered by health insurance. The fraction of users of psychoactive drugs (antidepressants, tranquilizers and sleeping pills) is relatively small (3 to 4%), but 2 to 3% are

[16] On s.e. correction with IV techniques and notably the comparison between Moulton (1986) and robust methods of estimation with clustering, see page 11 in Hoxby (2005).

refusals—later attempts to impute a yes to a refusal do not change the results. A fraction of 8.5% of respondents has used one of these three medications within the last four weeks. The last four rows give the mean and s.d. of imputed employment protection, with or without using information on temporary work: in the last two rows, temporary workers are assumed to have no employment protection and their associated index is zero. This correction for temporary employment makes little difference in sample means, and made almost no change to subsequent regressions.

Figures 2 to 5 then present a scatter plot of unconditional provincial means of various stress indicators and provincial EPL. They illustrate the relatively high and positive correlation between individual employment protection and overall stress, psychological stress and stress from skill needs. There is a weaker but reassuringly negative correlation between individual EPL and stress associated with job loss. The next key question is whether these correlations survive once various covariates are included, notably individual variables, sectors, occupation and local labour market conditions, as well as collective EPL and unionization.

4.2 Stress regressions

In all stress regressions, the sample is restricted to those having answered the questions on work-related stress, that is, those having worked in the year preceding the survey. The self-employed are excluded from the sample.

4.2.1 Cross-province identification

Table 2 displays the baseline regression on overall stress at work, where the EPL variables are those of the region in which the interviewed individual currently lives. Column 1 is the baseline regression with sample weights. Column 2 is a random effect regression. Column 3 adds a union density variable to the baseline specification. Column 4 adds the 1994-95 wave which is subject to the translation error in the stress questionnaire, as a comparison with Column 1. Column 5 adds 342 interaction terms (industry cross occupation). All specifications include gender, age, family, immigration, place of birth, education and year dummies. As expected, female workers, older workers and workers having experienced traumatic events in their youth report higher workplace stress. Notably, the 'trauma in the past' variable is remarkably significant and will be kept in most regressions when relevant.

In all specifications, it appears that both types of EPL (individual and collective) raise total stress at work. Individual EPL is the most significant variable of the two, whereas collective EPL is only marginally significant. Adding the union rate in the specification marginally raises the significance of collective EPL but reduces the coefficient of individual EPL. Including 342 interaction dummies (occupation multiplied by industry) reduces the coefficients of EPL, but they remain significant. The inclusion of the first wave (1994-95) reduces the significance of the coefficients.

How large are the effects? In the baseline equation, moving from Newfoundland's level of EPL to that of British Columbia (from 2 to 5) would raise stress by 0.6 units, when the standard deviation of stress is 4.33: 14% of one standard deviation of stress can be explained by individual EPL, while another 0.2 units of stress are accounted for by collective EPL when moving from Alberta's level to that of Quebec, that is, another 5% of one standard deviation. It looks small but this is an average effect for all stress dimensions. Sub-components of stress will be shown to be quantitatively much more affected by EPL in Sub-section 4.3.

4.2.2 Imputation of EPL and within-region estimates

The alternative estimation strategy discussed above is to impute actual employment protection to individuals, as described in Section 3.2.2, using for this purpose various years of the Canadian Labour Force Survey (EPA-LFS). Results are displayed in Table 3. Generally speaking, the estimates obtained through this method are marginally smaller and slightly less significant: t-stat of EPL_ind_fit are around 3.0 instead of 3.3, while coefficients go from 0.24 to 0.19. Note here that one does not need to implement Moulton's correction or a regional clustering correction since the explanatory variable is no longer constant within regions.

In addition, the imputation method makes it possible to include regional effects in the econometric specification. If one runs the benchmark specification with the imputed EPL in removing industry and occupation dummies (both being the main determinant of imputed EPL) and without regional dummies, I obtain positive coefficients with t-stat of 6.85 and 1.63 respectively for individual and collective EPL. Now adding regional dummies but still in the absence of industry and occupation dummies, we obtain a highly significant impact of EPL: t-stat are respectively 4.76 and 3.70. It is of course difficult to know whether this is due to EPL per se or due to the fact that more stressful sectors or occupations are those in which seniority and firm size are greater, generating a higher degree of imputed EPL. The only way to know would be to have both regional and industry and occupation dummies, which is impossible here since most of the variance in imputed EPL is due to these indicators.

In any case, the impact of EPL on stress is actually observed first between regions; and second, within regions but between industries and occupations. When region, industry and occupation effects are added, as explained above, the significance disappears: EPL is almost perfectly collinear to other controls, generating a classical multicollinearity problem. Only time variations in EPL would allow for recovery of an effect of EPL in this type of specification, suggesting the extensions which I will discuss in the conclusion.

4.2.3 Regional vs. individual clustering

To address the multilevel clustering issue (individual+ regional), Table 4 re-runs the benchmark regression for specific years. Interestingly, controlling for regional clustering in cross-sections estimates raise standard errors (especially in 2000), indicating that the correlation within provinces is negative rather than positive.

One can also note the stability of coefficients across years. This confirms that most of the results are driven by the cross-section. Unreported between-estimator regressions in the pooled cross-sections bring the same results, while fixed-effects estimators lead to insignificant coefficients of EPL.[17]

In the last column of Table 4, I also tried Wooldridge's (2003, Sn III) suggestion to proceed according to two steps: first, regress the stress indicator on all variables which are not clustered and a set of regional dummy indicators (denoted by δ_k, $k = 1, ..., 10$). Then, by regressing the fixed effects themselves on the two variables EPL_ind and EPL_coll. I obtained the following coefficients: 0.2007 (2.40) and 0.0342 (1.83) respectively, and a R^2 and $adj - R^2$ of 0.53 and 0.38. The t-stat in parenthesis corresponds to significance levels in the t_{10-2} distribution which are respectively: 2.2% and 5.3%. To sum up, *regional clustering is not a major issue here* especially

[17] Hausman tests on random effects, which tests for coefficients being different between random effects and between-estimators regressions actually show mixed results: sometimes the null is rejected, sometimes not.

after accounting for individual clustering and hereafter, I exclusively present "robust" estimates with individual clustering.[18]

4.3 Components of stress and job's characteristics

Table 5 investigates the impact of EPL on the various sub-components of workplace stress. In all specifications displayed in the top part of the table, all same controls as in Table 2 (Column 1) are included. It appears that individual EPL raises psychological stress, lowers stress from layoffs, and raises physical stress and stress from strain. The effect of collective EPL is more balanced as it sometimes reduces stress (physical exertion, psychological stress and strain) but raises layoff stress. However, this last result appears to be due to a lack of controls. This is why I replicate all regressions in adding the regional union density variable, as displayed in the bottom panel of the table. The positive effect of collective EPL on layoff stress is now no longer significant. One also finds that unions raise layoff stress. This may be due to powerful regional unions succeeding in raising wages but at the cost of increasing job fragility.

These regressions also explain why the effect of EPL on total stress at work was positive and not negative: as shown above, the total stress indicator includes stress from job insecurity with a small weight. Job insecurity has a range (0,4) whereas total workplace stress ranges from 0 to 48. If one arbitrarily increased the weight of job insecurity, the sum of all dimensions of stress could actually be negatively correlated with EPL. The positive coefficient of EPL is thus partly the outcome of a normalization chosen by the team of sociologists having derived, totally independently of this work, the various stress variables.

Finally, returning to the 13 base questions used to generate the stress variables and described in Section 2.1.1, I replicated the same analysis with these questions. Since the answers take discrete values in (1,5), I run an ordered logit estimate unless they do not converge, in which case a linear regression is estimated: the latter procedure provides biased standard errors but consistent estimations of the coefficients. This is the same list of controls as in Table 2. Results are in Table 6. The title of each column gives a summary of the question and the table reads as follows: a positive coefficient in Column 1 for instance means that it is more likely to read "*No learning required* ", and so on. Focussing on the effect of individual EPL, one finds that it is associated with more hectic jobs, more conflicting demands, more hostility and supervisors being less helpful (with marginal significance), but there is no systematic relation with job satisfaction nor job security. The second line indicates that high EPL_coll jobs require little experience, are low skilled, provide little freedom; they are neither repetitive nor hectic, do not require any particular physical exertion, but are associated with quite high levels of hostility, with supervisors being unhelpful and workers, very significantly, receiving little support in getting their jobs done. Interestingly, there is no correlation between EPL and job satisfaction, as the last column (bottom panel) indicates.

[18] Table A3 in the Appendix adds several controls, many of which turn out to be significant: health status (self-perceived), social support (self-perceived), body weight, language (French speakers are not significantly different from the English speaking reference group, but other groups are less stressed). Local unemployment (in one of the 382 geographical Census divisions) reduces slightly both the coefficient on EPL and its significance, but this is still significant at the 5% level. Other local controls do not change the broad picture. A "chronic stress" variable, i.e. stress in other dimensions than work, turns out to be extremely significant. One interpretation is that the ability to cope with stress depends very much on other sources of stress. Table A4 in the Appendix investigates further the role of local conditions, in adding interaction terms between local unemployment and EPL.

4.4 Elements of falsification

This Sub-section provides further elements of falsification: are there areas of stress unrelated to work that are indeed uncorrelated with EPL? Table 7 responds to this question. I regress three components of stress in principle unrelated to work on EPL and on the same list of individual controls as in Table 2. This is done on the same sample of employed workers. These three additional variables are "chronic stress", adding up stress in all areas except workplace stress, stress associated with personal life and finally stress associated with financial problems. They are all unrelated to workplace stress, following the dataset's construction.

One expects the coefficients of EPL in the regressions to be insignificant and the coefficients to be smaller. As Columns 1 to 3 indicate, this is indeed the case for EPL_ind: t-statistics are reduced from 3.5 to 2.1 or even 1.3. For EPL_coll, the coefficients turn negative with marginal significance.

The weak residual positive correlation between EPL_ind and the non-work-related stress variables can also be explained. In Columns 4 to 6, workplace stress is added among the regressors. This variable is highly significant, and all positive coefficients of EPL_ind now become insignificant. The interpretation is as follows: the ability to cope with stress in one sphere of life is strongly affected by the intensity of stress in other spheres. Thus, a seemingly innocuous family occurrence could become stressful were one's job already stressful, which explains the (weak) residual correlations in Columns 1 to 3 between EPL and family or chronic stress and why these correlations disappear in Columns 4 to 6.

4.5 Psychoactive drugs and depression

A final check is to use additional information on individual health conditions, the so-called objective measures, to confirm our findings. For instance, Table A5 in the Appendix indicates a strong positive link between general stress and depression.[19] This is sometimes referred too as a burnout effect: workers have a stock of energy that becomes depleted over time.

Equation (3) in Section 3.3 can be thought of as a depression equation, where one uses as regressors the interaction between being employed and provincial EPL. As detailed above, one requires instruments for the individual employment dummy. A good set of instruments is provided by local labour market conditions, as well as household size interacted with gender. This works fairly well, as reflected in Table 8. Local unemployment is largely negatively associated with individual employment, while local activity rates raise individuals' probability of being employed.

In Table 9, one systematically compares across columns the ordinary probit regressions and their IV-probit counterparts. The successive variables on the left hand-side are: a depression indicator, consumption of one of the psychoactive drugs discussed in Section 3.1.4, and an indicator for abnormally high blood pressure. An indicator for health insurance coverage covers for individual "demand effects". For the depression indicator, antidepressants and tranquilizers, there is evidence of a slight causal role of individual EPL. There is no effect of EPL on

[19] Specifications with chronic stress as a variable are available only for waves 1, 4 and 5 (18 000 obs.), while specification without this variable are available for all five waves (33 000 obs.). The correlation between current stress and depression scores (and probability) is large. Trauma and a female dummy are also very strongly positively associated with depression. Local conditions, in contrast, do not appear to play a major role (even in Canada).

blood pressure. In all the regressions, the null of exogeneity of instruments is never rejected at conventional significance levels according to the standard tests.

5 Concluding comments

Does EPL improve the wellbeing of employed workers? In this paper, I have discussed the following conjecture, that stress and strain at work may depend positively, and not negatively, on EPL, and have provided empirical support for this conjecture. The data analysis indicates positive effects of EPL on many areas of stress in the data, in several databases. I also find weaker but positive links between depression among employed workers and EPL, and similar links between the use of some psychoactive drugs among employed workers and EPL.

This is only a starting point. Future work should in particular investigate the relation between EPL and stress in other countries. The United States is a good candidate, since a number of studies have examined wrongful discharge laws introduced there in the 1970s and 1980s (e.g. Autor et al. 2006). Unfortunately, rare are datasets which allow for workplace stress to be measured in the US, or at least in which individuals can be matched with their State of residence. The only surveys mentioned thus far pertain to the post-2002 period. Unfortunately, there is little or no variation in EPL across US states posterior to that year.

More generally, the hypothesis could be tested in virtually all countries, provided that data on stress be collected and that there be a source of exogenous variation in EPL. Another way to approach the same set of questions is to focus on firms' own data. For instance, it may be interesting to find evidence of variations in the quality of industrial relations, the size of firms, human resources management, all of which would be correlated with the rigidity of EPL.

As a final remark, it is important to have a better understanding of the unexpected negative effects of EPL on workers' wellbeing. This may open the way to labour market reforms in several European countries. Many observers appear to agree that EPL harms outsiders (unemployed, female, and young workers), but were it also to be established that EPL affects groups of workers closer to the political core (protected workers), the terms of the debate would drastically change, and this implies even more scope for reform: following some Scandinavian countries, a better alternative to protect workers would be the combination of high unemployment insurance, active monitoring of job seekers and low or no restrictions on dismissal.

Appendix

A Data Appendix

Number of longitudinal panel members: 17,276 ; Number of panel members who have died: 1,279 ; Number of panel members who have been institutionalized: 161 ; Number of respondent panel members: 12,484 ; Number of non-respondent panel members: 3,352. A full description of the survey can be found here: http://www.statcan.ca/cgi-bin/imdb/p2SV.pl?Function=getSurvey&SDDS
=3225&lang=en&db=IMDB&dbg=f&adm=8&dis=2, or simply in finding the website in googling NHPS Canada.

A.1 Response and attrition

A.1.1 Response rates

In this specific case of a health survey, non-response is a particular concern. The appendix (Table A2) thus provides various details on death, attrition and non-response. In short, the response rate varies between 80 and 92%. Conditional on being a respondent, the refusal to reply to individual questions, including those on drug consumption, is generally around 2% or less. The next table provides some overview of these problems. Further, according to the documentation, "*the income variables have refusal rates of close to 4%. Some of the labour force submodules and the mastery submodule (stress module) have the highest refusal rates at 0.11% and 0.12% respectively*". In other words, people are sometime reluctant to talk about money, but seem unconcerned about talking about stress.

A.1.2 Attrition rates

Attrition is a loss in sample size due to non-respondents i.e. refusals, no-contacts, unable to trace cases, etc. Note that decease respondents are not considered part of attrition for the NPHS longitudinal sample. The cumulative attrition rate is presented for each cycle. Each attrition rate is calculated using the number of individuals found in the Full subset of respondents i.e. those who completed the questionnaire in all cycles. The main cause of attrition is due to an increasing number of respondents who refuse to continue to participate to the survey. Cycle Attrition rate. Cycle 2 : 9.3%. Cycle 3 : 15.4%. Cycle 4 : 21.4%. Cycle 5 : 27.4%

A.2 Weighting

"Weight WT64LS is called the "square weight" and applies to the 17,276 members that make up the original longitudinal sample. All non-response should be taken into account for any calculation. Weight WT62LF is called the "Longitudinal Full" weight and applies to the 12,546 records that are included in the "Full" subset of respondents. Weight WT62LFE is called the "Longitudinal Full C1 and C5" weight and applies to the 13,629 records that are included in the "Full C1 and C5" subset of respondents. Weight WT62SLF is called "Longitudinal Full Share" weight and applies to the 12,226 respondents that are included in the "Full Share" subset of respondents." Source. Longitudinal Documentation, Cycle 5.

A.3 Confidentiality

"Confidentiality concerns preclude general dissemination of longitudinal NPHS data in public use microdata file (PUMF) format. However, access to all the longitudinal master microdata files including the Cycle 4 and Cycle 5 data (as well as access to the cross-sectional master microdata files, which exist for the first three cycles of the NPHS) is available through Statistics Canada's Research Data Centres (RDCs) program. (...) RDCs provide researchers with access, in a secure university setting, to microdata from population and household surveys. The centres are staffed by Statistics Canada employees.

They are operated under the provisions of the Statistics Act in accordance with all the confidentiality rules and are accessible only to researchers with approved projects who have been sworn in as "deemed employees". RDCs are located throughout the country, so researchers do not need to travel to Ottawa to access Statistics Canada microdata. More information is available at the Research Data Centre Program web site: http://www.statcan.ca/english/rdc/index.htm.

A second option, if the RDCs are not accessible for the researcher, is Health Statistics Division's Remote Access service. This service provides researchers with a means to develop and test their own computer programs using synthetic files that mimic the actual master files. Researchers then submit their programs to a dedicated e-mail address. The programs are run against the master microdata files on an internal secure server, outputs are vetted for confidentiality, and sent back to the researcher by return e-mail. For more information on this service, please contact the Data Access team at nphs-ensp@statcan.ca."

A.4 Match with local labor markets

The NPHS survey includes detailed geographical variables: region of residence, census divisions, census sub-divisions and zip code. I matched the census divisions defining 382 local areas of size approximately 80 000 persons to variables extracted from the 1996 and 2001 census: local unemployment rate; local activity rate ; local density of population ; local share of male in the population ; and the growth rate of population between 1996 and 2001. Except for the last variables, I attributed the values of the 1996 Census to Cycle 1 and 2 ; the values of the 2001 Census to Cycles 4 and 5 ; and the mean of the two Census for Cycle 3. Future work will attempt to match individuals with the exact longitude and latitude.

A.5 Clustering and s.e. corrections

A.5.1 Individual clustering

In both the "subjective variable" approach and the "objective variable" approach, there are various problems with the covariance structure of error terms that must be discussed and solved. The first problem is that the panel structure of individuals leads to individual clustering, that is usually accounted for by within-panel clustering or random effects models. In general and unless specified, I use the Huber-White sandwich robust estimators augmented to account of cluster correlation.

A.5.2 Regional clustering

Since I use a provincial indicators of employment protection, the correlation of error terms within provinces may bias the s.e. of OLS estimates (Moulton 1986, 1987 and 1990, Moulton and Randolph 1989). See also Technical Appendix B for a description of the covariance structure. I will use a pragmatic approach here: instead of programming a multi-level correction for clustering which turns out to be computationally too demanding at this stage[22], I will present, in a robustness sub-section, the results of regional clustering correction[23] in the two cross-sections available (2000 and 2002) and show that, overall, the within-region correlation in error terms does not appear to be a big problem.

[22] See also Bertrand et al. (2004) on how to account for both intra-class and serial correlation, and Angrist and Lavy (2002) on the role of small number of clusters on the correction of s.e. It may be fruitful to rotate the various dimensions (time, states) of these diff-in-diff approaches to obtain a similar problem with intra-states and intra-individuals correlation in error terms.

[23] See Hoxby (2005), pp. 8-12 for a detailed discussion of the pros and cons of programming Moulton's (1986) corrected s.e. vs. the Stata robust cluster corrected standard errors. In short, while Moulton's strategy is more efficient in that it impose more structure to the covariance structure of error terms, it is less robust to additional forms of intraclass correlation. In large provinces such as in Canada, where moreover population density is extremely heterogeneous, it is probably better to be more flexible in terms of intraclass correlation.

A.5.3 Correction of s.e. after imputation

The imputation approach, whereby, in some robustness regressions, the level of EPL of a given individual is generated from another dataset, increases the variance of the explanatory variables but generates per se a number of additional issues: indeed, there are now have two sources of randomness: error terms in equation (1) and error in the fitted variable. A standard method discussed in Little and Rubin (1987, chapter 12) is to bootstrap (here, 20 times) the imputation and estimate 20 times equation (1). The coefficients and s.e. are a weighted average of each individual estimate. All displayed t-stats of regressions using generated regressors are corrected according to their formula (see Appendix D.2). The same correction of standard errors will be applied to equation (3).

B Additional Appendix. Additional evidence on bullying in France.

The effects uncovered in the paper, in particular the harassment effect, may sound extreme to an anglo-saxon reader. However, a number of monographic studies in France, a high EPL country, support this idea given the poor quality of industrial relations. For instance, Seiler (2000), surveying 1210 employees in Alsace at "Médecine du Travail" in a non-representative sample, found that 9.6% of the workers met the criterion for moral harassment (bullying), although only 7.3% reported it. It came from the hierarchy in 49% of cases, from co-workers in 25% of cases, from both in 17% and only in 5% of cases from employees under supervision. It started after workplace reorganization (29%), leave of absence by the worker (26%), the arrival of a new manager (28%) or after some conflict. It led to various disorders (mood 72%, sleep 70%, psychological disorder 52%) and resulted also in anxiety (60%) and abnormal fatigue. Finally and most relevant for our purpose, the hostility faced by these employees led to leaving the firm in 61% of cases, including 44% after a voluntary quit. Pressures are a substitute to firing. A study carried out by the IPSOS poll institute, in 2000, based on a sample of 471 representative employees, revealed that 30% answered yes to "Have you *ever* faced bullying, moral harassment?", including 31% for men, 29% for women, 30% in the private sector, and interestingly, 29% in public firms! 37% reported having witnessed bullying, moral harassment, 24% answered yes to "Did your supervisor avoided or refused to talk, repeatedly and visibly?", 16% answered yes to "Did your supervisor took away responsibility, gave your workload to colleagues?", 12% had been once subjected to insults or offending behavior from supervisor (repeatedly), and also, 12% believed that bullies were intended to make the individual leave or move to another department without indemnity. Not suprisingly, France is also often cited as a country where psychotropics are consumed on a massive scale, a dimension that was also considered in the data analysis.

According to a governemental French study (DREES 2003), consumption of anti-depressants in France in 2000 amounted to 543 billion Euros, or 10% of the overall social security deficit (including pensions) and about 0.1% of GDP. Recent international studies in clinical psychology, conducted in five European countries (Alonso et al. 2004), have estimated multivariate models of psychotropic drug use, pooling six European countries and controlling for various individual characteristics–gender, age categories, marital status, education, labor market status and urbanicity. It is highly interesting to notice that the country effects (expressed as odd-ratios of the regression) are, in diminishing order, 3.0 for France, 2.3 for Spain, 2.0 for Italy, 1.69 for Belgium, and 0.8 for Germany, with the Netherlands as the reference. The ranking is fairly close to the stringency of EPL according to the OECD, although a definitive test would attempt to interact the "employment status" coefficient with the country effects.

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Table 1. Sample statistics

	Mean	s.d.	
Male	49.7		
Immigrants	19.6		
Urban area	81.4		
Age (μ)	43.3	(10.9)	
Household size (μ)	3.06	(1.39)	
Primary education	17.8		
Secondary education	15.5		
Some post seconsdary education.	26.6		
Tertiary	40.7		
Trauma (0-7)	1.06	(1.23)	
No medical insurance	0.23		
Psychotropic drugs	yes	no	missing
1.Tranquilizer	0.030	0.947	0.030
2.Anti-depressant	0.047	0.930	0.023
3.Sleeping pill	0.034	0.943	0.026
Yes to one psychotropic drug	0.085		
Other variables	mean	sd.	
Depression (score, 0-8)	0.38	(1.44)	
Depression (proba, 0-1)	0.058	(0.22)	
Blood pressure	0.095	(0.29)	
Overall (0-48)	10.42	(4.33)	
Stress from skill requirement (0-12)	4.78	(2.20)	
Stress from decision lattitude (0-8)	2.53	(1.64)	
Stress from psychological demands (0-8)	4.52	(1.71)	
Stress from physical exertion (0-4)	1.84	(1.22)	
Stress from job insecurity (0-4)	1.24	(0.96)	
Stress from supervisor or coworkers (0-12)	4.12	(1.29)	
Stress from job strain strain (0.2-5)	0.95	(0.31)	
Imputed EPL variables (from EPA-LFS)	mean	sd.	
EPL_ind	4.18	(2.88)	
EPL_coll	6.14	(4.60)	
EPL_ind $^{(a)}$	4.06	(2.96)	
EPL_coll$^{(a)}$	5.80	(4.65)	

(a): accounting for the information on whether the employed individual was under a temporary contract and attributing no advance notice in this case.

Table 2. Baseline regressions for overall worplace stress

Estimation	robust LS	R.E.	adds union	adds cycle 1	adds Ind.*Occ.
Dep. variable:			workplace stress		
EPL_ind	0.243	0.176	0.222	0.174	0.193
	(3.2)***	(3.3)***	(2.9)***	(2.7)***	(2.4)**
	[3.7]***		[3.3]***	[3.2]***	[2.7]***
EPL_coll	0.023	0.021	0.025	0.023	0.018
	(1.5)	(1.9)*	(1.6)	(1.8)*	(1.2)
	[1.8]*		[1.8]*	[2.2]**	[1.3]
Trauma	0.300	0.284	0.300	0.401	0.298
	(6.0)***	(7.4)***	(6.0)***	(8.9)***	(6.1)***
	[6.9]***		[6.9]***	[10.5]***	[6.9]***
Sex	-0.103	-0.016	-0.104	-0.030	-0.088
	(0.7)	(0.1)	(0.7)	(0.2)	(0.6)
	[0.8]		[0.8]	[0.3]	[0.7]
Urban	0.001	0.015	0.001	-0.027	-0.024
	(0.0)	(0.2)	(0.0)	(0.2)	(0.2)
	[0.0]		[0.0]	[0.3]	[0.2]
EducD1	0.280	ref.	ref.	ref.	ref.
	(0.3)				
	[0.3]				
EducD2	-0.367	-1.172	-0.618	-0.472	0.960
	(0.4)	(1.5)	(0.8)	(0.3)	(1.2)
	[0.5]		[0.8]	[0.3]	[1.3]
EducD3	-0.580	-1.063	-0.828	-0.499	0.723
	(0.7)	(1.6)	(1.2)	(0.4)	(1.0)
	[0.9]		[1.2]	[0.4]	[1.2]
EducD4	-0.388	-0.661	-0.640	-0.117	0.922
	(0.5)	(1.0)	(0.9)	(0.1)	(1.3)
	[0.6]		[0.9]	[0.1]	[1.5]
EducD5	-0.214	-0.106	-0.465	0.120	1.078
	(0.2)	(0.1)	(0.5)	(0.1)	(1.3)
	[0.3]		[0.6]	[0.1]	[1.5]
EducD6	-0.179	-0.429	-0.427	0.206	1.217
	(0.2)	(0.7)	(0.6)	(0.2)	(1.7)*
	[0.3]		[0.6]	[0.2]	[2.0]**
EducD7	-0.262	-0.284	-0.513	0.154	1.250
	(0.3)	(0.4)	(0.7)	(0.1)	(1.7)*
	[0.4]		[0.7]	[0.1]	[2.0]**
EducD8	-0.573	-0.621	-0.828	-0.169	0.694
	(0.7)	(0.9)	(1.1)	(0.1)	(0.9)
	[0.9]		[1.2]	[0.1]	[1.1]

Table 2. Baseline regressions for overall workplace stress (continued)

EducD9	-0.042	-0.434	-0.290	0.136	1.293
	(0.1)	(0.7)	(0.4)	(0.1)	(1.8)*
	[0.1]		[0.4]	[0.1]	[2.1]**
EducD10	-0.077	-0.176	-0.328	0.270	1.415
	(0.1)	(0.3)	(0.4)	(0.2)	(2.0)**
	[0.1]		[0.5]	[0.2]	[2.3]**
EducD11	0.049	-0.195	-0.202	0.453	1.438
	(0.1)	(0.3)	(0.3)	(0.3)	(2.0)**
	[0.1]		[0.3]	[0.3]	[2.4]**
EducD12	-0.524	-0.943	-0.770	0.114	0.784
	(0.7)	(1.3)	(1.0)	(0.1)	(1.1)
	[0.8]		[1.1]	[0.1]	[1.2]
EducD13	ref.	0.373	-0.258	0.243	0.000
		(0.4)	(0.3)	(0.2)	(.)
			[0.3]	[0.2]	[.]
EducD14	0.216	-0.323	-0.033	0.475	1.180
	(0.2)	(0.4)	(0.0)	(0.3)	(1.2)
	[0.3]		[0.0]	[0.3]	[1.4]
Immi<10 yrs.	-0.917	-0.681	-0.928	-0.206	-0.678
	(1.2)	(0.9)	(1.2)	(0.3)	(0.9)
	[1.2]		[1.2]	[0.3]	[0.9]
Immi>=10 yrs.	-0.000	-0.276	-0.008	-0.029	-0.037
	(0.0)	(0.4)	(0.0)	(0.0)	(0.1)
	[0.0]		[0.0]	[0.1]	[0.1]
Gr. Age 2	1.671	1.617	1.667	1.983	1.344
	(5.0)***	(6.5)***	(5.0)***	(7.3)***	(4.1)***
	[5.3]***		[5.3]***	[7.6]***	[4.3]***
Gr. Age 3	1.804	1.690	1.803	2.159	1.492
	(5.7)***	(6.9)***	(5.7)***	(8.3)***	(4.7)***
	[6.0]***		[6.0]***	[8.7]***	[5.0]***
Gr. Age 4	2.108	1.830	2.107	2.203	1.733
	(6.8)***	(7.5)***	(6.8)***	(8.5)***	(5.6)***
	[7.2]***		[7.2]***	[8.9]***	[5.9]***
Gr. Age 5	1.840	1.727	1.840	1.933	1.532
	(5.9)***	(7.2)***	(5.9)***	(7.5)***	(4.9)***
	[6.3]***		[6.3]***	[7.8]***	[5.2]***
Gr. Age 6	1.635	1.626	1.636	1.582	1.431
	(5.3)***	(6.8)***	(5.3)***	(6.1)***	(4.7)***
	[5.6]***		[5.6]***	[6.4]***	[5.0]***

Table 2. Baseline regressions for overall workplace stress (continued)

Gr. Age 7	1.551	1.480	1.551	1.569	1.351
	(5.0)***	(6.2)***	(5.0)***	(6.1)***	(4.4)***
	[5.3]***		[5.3]***	[6.3]***	[4.6]***
Gr. Age 8	0.711	0.802	0.713	0.769	0.500
	(2.3)**	(3.4)***	(2.3)**	(3.0)***	(1.6)
	[2.4]**		[2.4]**	[3.0]***	[1.7]*
Union density	-	-	-0.667	-	-
			(0.53)		
			[0.6]		
2000	ref.	-0.005	-	-0.498	-
		(0.1)		(5.2)***	
				[4.7]***	
2002	0.005	ref.	0.005	-0.472	0.013
	(0.1)		(0.1)	(4.4)***	(0.1)
	[0.1]		[0.0]	[4.2]***	[0.1]
Constant	14.6	21.1	15.5	20.7	10.1
	(6.4)***	(16.1)***	(7.8)***	(12.4)***	(6.7)***
	[6.7]***		[7.9]***	[13.3]***	[7.4]***
Birth continent (D1-D7)	Yes	Yes	Yes	Yes	Yes
Living arrangement (D1-D7)	Yes	Yes	Yes	Yes	Yes
Household type (D1-D6)	Yes	Yes	Yes	Yes	Yes
Household size (D1-D9)	Yes	Yes	Yes	Yes	Yes
Industry (D1-D16)	Yes	Yes	Yes	Yes	No
Occupation (D1-D47)	Yes	Yes	Yes	Yes	No
Ind. * Occ. (D1-D342)	No	No	No	No	Yes
Observations	11421	11421	11421	17069	11421
R-squared	0.08	-	0.08	0.09	0.12
Number of clusters	6752	6752	6752	8386	6752

Robust t-statistics in parentheses ( ) : individual clustering ; Robust t statistics in brackets [ ] : no individual clustering ; * significant at 10%; ** significant at 5%; *** significant at 1%

Table 3. Impact of EPL on workplace stress when EPL is imputed with the LFS survey

Estimation.	robust LS	R.E.	adds union	adds cycle 1	adds Ind.*Occ.
Dep. variable:			workplace stress		
EPL_ind (imputed)	0.187	0.128	0.163	0.126	0.169
	(3.0)***	(2.8)***	(2.6)***	(2.3)**	(2.5)**
	[3.4]***		[3.0]***	[2.8]***	[2.9]***
EPL_coll (imputed)	0.013	0.017	0.022	0.019	0.018
	(0.8)	(1.3)	(1.2)	(1.3)	(1.0)
	[0.9]		[1.4]	[1.5]	[1.2]
Observations	11421	11421	11421	11421	17069
R^2	0.08	-	0.08	0.12	0.12
Number of clusters	6752	6752	6752	6752	6752

Robust t-statistics in parentheses ( ) : individual clustering ; Robust t statistics in brackets [ ] : no individual clustering ; All t-stat were adjusted to imputation-error (Little-Rubin 1987); * significant at 10%; ** significant at 5%; *** significant at 1% ; Other controls: same as listed in table 2 (age, urbanicity, family, education, immigration, birth place, year, industry, occupation)

Table 4. Regional clustering & variable clustering

Estimation	robust LS	robust LS	robust LS	two-step
Cross-sections:	2000 & 2002	2000	2002	2000 & 2002
Dep. variable:	Workplace stress	Workplace stress	Workplace stress	reg. dummies from first stage
EPL_ind	0.243	0.298	0.193	0.207
	(3.43)***	(5.48)***	(2.04)**	-
	[3.71]***	[3.39]***	[1.97]**	[2.40]**
EPL_coll	0.023	0.023	0.024	0.034
	(2.32)	(2.82)***	(1.14)	-
	[1.76]*	[1.33]	[1.27]	[1.83]*
Observations	11421	5942	5479	10
R-squared	0.08	0.09	0.09	0.53
Number of clusters	10	10	10	-

Robust t-statistics in parentheses ( ) : REGIONAL: clustering ; Robust t statistics in brackets [ ] : no REGIONAL clustering ; * significant at 10%; ** significant at 5%; *** significant at 1% ; Other controls: same as listed in table 2 (age, urbanicity, family, education, immigration, birth place, year, industry, occupation)

Table 5. Sub components of workplace stress

Dep. variable: stress from	Work (total)	Skills need	Latitude dec.	Psych. demands	Job insec.	Phy. exertion	Superv.-cowk	Job strain
EPL_ind	0.257	-0.014	0.039	0.186	-0.034	0.037	-0.019	0.028
	(3.4)***	(0.4)	(1.4)	(6.2)***	(2.0)**	(2.0)**	(0.6)	(5.4)***
	[3.9]***	[0.5]	[1.6]	[7.1]***	[2.3]**	[2.3]**	[0.7]	[5.9]***
EPL_coll	0.023	-0.008	0.006	-0.025	0.009	-0.013	0.043	-0.003
	(1.5)	(1.3)	(1.1)	(4.3)***	(2.7)***	(3.5)***	(7.0)***	(3.1)***
	[1.8]*	[1.5]	[1.3]	[4.9]***	[2.9]***	[4.1]***	[7.6]***	[3.5]***
Sex	-0.072	0.557	0.477	0.080	0.088	-0.084	-0.172	0.073
	(0.5)	(8.2)***	(8.9)***	(1.4)	(2.7)***	(2.3)**	(2.8)***	(7.0)***
	[0.5]	[9.5]***	[10.1]***	[1.6]	[3.0]***	[2.7]***	[3.0]***	[7.7]***
Observations	11224	11340	11335	11326	11332	11344	11258	11315
R-squared	0.08	0.32	0.18	0.10	0.06	0.34	0.04	0.11
Number of clusters	6696	6715	6714	6713	6714	6716	6702	6710

Adding regional union density

Dep. variable: stress from	Work (total)	Skill need	Latitude dec.	Psych. demands	Job insec.	Phy. exertion	Superv.-cowk	Job strain
EPL_ind	0.248	-0.038	0.008	0.094	0.007	0.002	0.079	0.014
	(3.2)***	(1.2)	(0.3)	(3.0)***	(0.4)	(0.1)	(2.4)**	(2.6)***
	[3.6]***	[1.4]	[0.3]	[3.5]***	[0.5]	[0.1]	[2.6]***	[2.9]***
EPL_coll	0.024	-0.005	0.010	-0.014	0.003	-0.008	0.031	-0.001
	(1.5)	(0.8)	(1.7)*	(2.2)**	(1.0)	(2.1)**	(4.5)***	(1.3)
	[1.7]*	[0.9]	[1.9]*	[2.5]**	[1.1]	[2.4]**	[5.0]***	[1.4]
Sex	-0.073	0.555	0.474	0.072	0.092	-0.088	-0.162	0.072
	(0.5)	(8.2)***	(8.9)***	(1.3)	(2.8)***	(2.4)**	(2.6)***	(6.9)***
	[0.6]	[9.5]***	[10.1]***	[1.4]	[3.1]***	[2.8]***	[2.8]***	[7.6]***
Union density	-0.301	-0.747	-0.958	-2.852	1.298	-1.099	3.052	-0.436
	(0.2)	(1.4)	(2.2)**	(5.8)***	(4.5)***	(3.7)***	(5.7)***	(5.1)***
	[0.3]	[1.6]	[2.4]**	[6.5]***	[5.1]***	[4.2]***	[6.3]***	[5.6]***
Observations	11224	11340	11335	11326	11332	11344	11258	11315
R-squared	0.08	0.32	0.18	0.11	0.06	0.34	0.05	0.11
Number of clusters	6696	6715	6714	6713	6714	6716	6702	6710

Robust t-statistics in parentheses ( ) : individual clustering ; Robust t statistics in brackets [ ] : no individual clustering ; * significant at 10%; ** significant at 5%; *** significant at 1% ; Other controls: same as listed in table 2 (age, urbanicity, family, education, immigration, birth place, year, industry, occupation, + body weight dummies). See the text for the full description of left handside variables.

Table 6. "Base" questions on workplace stress

Dep. variable:	No learning	No high skills	No freedom$^{(a)}$	No repetitivity	Not hectic	Conflicting	No job security
EPL_ind	-0.055	-0.052	0.012	-0.001	-0.088	0.086	0.012
	(1.6)	(1.4)	(0.8)	(0.0)	(2.5)**	(2.6)**	(0.3)
	[1.8]*	[1.6]	[0.8]	[0.0]	[2.9]***	[2.8]***	[0.4]
EPL_coll	0.020	0.020	0.009	0.048	0.017	-0.008	0.005
	(2.9)***	(2.6)***	(2.7)***	(6.6)***	(2.3)**	(1.2)	(0.7)
	[3.1]***	[3.0]***	[3.0]***	[7.4]***	[2.6]***	[1.3]	[0.8]
Union density	2.866	1.513	0.302	5.927	3.900	-1.074	2.359
	(5.0)***	(2.6)**	(1.2)	(10.1)***	(6.8)***	(2.0)**	(3.8)***
	[5.4]***	[2.8]***	[1.3]	[11.4]***	[7.7]***	[2.1]**	[4.3]***
Trauma	-0.030	-0.028	0.015	-0.080	-0.079	0.072	0.075
	(1.3)	(1.2)	(1.4)	(3.5)***	(3.7)***	(3.3)***	(3.3)***
	[1.4]	[1.4]	[1.6]	[3.9]***	[4.1]***	[3.6]***	[3.5]***
Sex	0.318	0.541	0.202	-0.280	-0.182	-0.034	0.203
	(4.7)***	(7.7)***	(6.7)***	(3.9)***	(2.7)***	(0.5)	(2.9)***
	[5.0]***	[8.6]***	[7.4]***	[4.4]***	[3.0]***	[0.6]	[3.2]***
Observations	11346	11343	11344	11344	11343	11328	11332

Dep. variable:	No physical	No discretion	No hostility$^{(a)}$	Superv. not help	No help in getting job done$^{(a)}$	Satisfied with job?$^{(a)}$
EPL_ind	-0.004	-0.015	-0.037	0.055	0.007	0.017
	(0.1)	(0.4)	(2.0)**	(1.6)	(0.6)	(1.4)
	[0.1]	[0.5]	[2.2]**	[1.8]*	[0.7]	[1.5]
EPL_coll	0.015	0.003	-0.010	0.014	0.013	-0.000
	(2.0)**	(0.4)	(2.7)***	(2.0)*	(5.7)***	(0.2)
	[2.3]**	[0.4]	[3.0]***	[2.1]**	[6.0]***	[0.2]
Union density	2.260	-2.713	-0.340	2.844	1.246	0.092
	(3.9)***	(4.7)***	(1.1)	(5.2)***	(6.2)***	(0.5)
	[4.4]***	[5.1]***	[1.3]	[5.5]***	[6.5]***	[0.5]
Trauma	-0.089	0.010	-0.061	0.046	0.024	0.024
	(4.0)***	(0.4)	(5.1)***	(2.1)**	(3.2)***	(2.9)***
	[4.5]***	[0.5]	[5.7]***	[2.2]**	[3.1]***	[3.3]***
Sex	0.138	0.598	0.068	-0.259	0.025	0.064
	(1.9)*	(8.9)***	(1.9)*	(4.0)***	(1.1)	(2.8)***
	[2.2]**	[9.9]***	[2.1]**	[4.3]***	[1.1]	[3.0]***
Observations	11344	11337	11338	11273	11314	11344

Robust t-statistics in parentheses ( ) : individual clustering ; Robust t statistics in brackets [ ] : no individual clustering ; * significant at 10%; ** significant at 5%; *** significant at 1% ; Dependent: 1: strongly agree ... 5 disagree ; For instance, in thecolumn no learning, a positive coefficient means that the higher the variable, the more likeley there is "no learning" on the job.Other controls: same as listed in

Table 7. Elements of falsification: impact of EPL on other forms of stress (unrelated to work)

Dep. variable:	Stress_chron	Stress_perso	Stress_fin	Stress_chron	Stress_perso	Stress_fin
EPL_ind	0.057	0.036	-0.013	0.035	0.021	-0.015
	(1.8)*	(1.7)	(1.3)*	(1.2)	(1.0)	(1.4)
	[2.1]**	[2.0]**	[1.3]*	[1.4]	[1.2]	[1.5]
EPL_coll	-0.011	-0.003	-0.004	-0.013	-0.004	-0.004
	(1.9)*	(0.7)	(2.0)**	(2.3)**	(1.1)	(2.1)**
	[2.2]*	[0.8]	[2.1]**	[2.7]***	[1.2]	[2.1]**
Trauma	0.221	0.109	0.030	0.191	0.087	0.028
	(10.3)***	(7.6)***	(4.6)***	(9.3)***	(6.4)***	(4.1)***
	[12.0]***	[8.9]***	[4.8]***	[10.7]***	[7.4]***	[4.3]***
Sex	0.218	0.231	-0.072	0.241	0.248	-0.071
	(4.5)***	(7.0)***	(4.7)***	(5.2)***	(7.8)***	(4.6)***
	[3.2]***	[8.0]***	[4.0]***	[5.9]***	[8.8]***	[4.9]***
Stress_wrk	-	-	-	0.095	0.069	0.007
				(19.0)***	(19.6)***	(4.2)***
				[20.1]***	[20.9]***	[4.3]***
Observations	11441	11437	11468	11441	11437	11468
R-squared	0.08	0.05	0.03	0.13	0.11	0.04
Number of clusters	6773	6771	6780	6773	6771	6780

Robust t-statistics in parentheses ( ) : individual clustering ; * significant at 10%; ** significant at 5%; *** significant at 1% ; Other controls: same as listed in table 2 (age, urbanicity, family, education, immigration, birth place, year, EXCEPT industry, occupation)

Table 8. IV model. Individual determinants of employment: local labor market variables as instruments

First stage: individual employment probability	WLS	RE
Dep. variable:	Individual employment	Individual employment
Local Unemp. rate	-0.004	-0.015
	(4.1)***	(3.8)***
Local Activity rate	0.003	0.014
	(3.3)***	(3.3)***
Local population density	0.000	0.000
	(1.5)	(1.5)
Local share of male	0.381	1.681
	(0.8)	(0.9)
Population growth 1996-01	0.001	0.003
	(0.8)	(1.0)
EPL_ind	0.010	0.037
	(2.0)**	(1.9)*
EP_coll	-0.001	-0.004
	(1.3)	(1.0)
Trauma	-0.018	-0.075
	(6.4)***	(6.9)***
Sex	-0.177	-0.799
	(19.0)***	(19.1)***
Observations	41357	41357
R-squared	0.21	
Number of clusters	11037	11037

Robust t-statistics in parentheses ( ) : individual clustering ; * significant at 10%; ** significant at 5%; *** significant at 1% ; Other controls: same as listed in table 2 (age, urbanicity, family, education, immigration, birth place, year EXCEPT industry, occupation, and in addition, household size interacted with gender). NB: no correction for clustering within local labor markets. Local controls: Census division (county) level.

Table 9. IV probit models. Anti-depressors and EPL

Dep. variable:	Probit Depress	IV-Prob Depress	Probit Antidepr	IV-Prob Antidepr	Probit Tranquil	IV-Prob Tranquil	Probit Sleeping	IV-Prob Sleeping	Probit Highbld	IV-Prob Highbld
Empl.*EPL_ind	0.041	0.057	0.024	0.081	0.045	0.060	0.010	0.013	-0.037	0.000
	(2.6)**	(2.8)***	(1.1)	(2.9)***	(1.9)*	(2.0)*	(0.4)	(0.5)	(1.7)*	(0.0)
Empl.*EPL_coll	0.003	0.003	-0.005	-0.006	0.015	0.022	-0.009	-0.010	0.007	0.008
	(0.8)	(0.7)	(1.0)	(1.1)	(2.6)**	(3.3)***	(1.8)*	(1.7)*	(1.4)	(1.4)
Empl.	-0.517	-0.622	-0.495	-0.835	-0.707	-1.020	-0.363	-0.237	-0.133	-1.077
	(7.4)***	(2.3)**	(5.0)***	(2.2)**	(6.7)***	(2.4)**	(3.5)***	(0.6)	(1.4)	(3.0)***
Trauma	0.153	0.151	0.126	0.122	0.122	0.119	0.104	0.107	0.034	0.019
	(17.3)***	(15.4)***	(10.3)***	(9.0)***	(8.8)***	(7.6)***	(8.0)***	(7.3)***	(2.5)**	(1.3)
Sex	0.216	0.210	0.331	0.306	0.113	0.087	0.155	0.166	0.074	-0.030
	(8.3)***	(5.2)***	(8.9)***	(5.4)***	(2.7)***	(1.4)	(4.1)***	(2.7)***	(2.1)**	(0.6)
Urban	0.000	-0.006	0.050	0.034	0.060	0.058	0.046	0.041	0.017	0.022
	(0.0)	(0.2)	(1.3)	(0.9)	(1.3)	(1.3)	(1.1)	(1.0)	(0.5)	(0.6)
No social insurance			-0.105	-0.058	-0.117	-0.072	-0.129	-0.091	-0.114	-0.102
			(2.9)***	(1.6)	(2.8)***	(1.8)*	(3.3)***	(2.4)**	(3.4)***	(3.0)***
Constant	-6.818	-6.740	-1.989	-1.990	-1.703	-0.640	-1.471	-1.503	-0.414	0.582
	(39.8)***	(30.3)***	(3.1)***	(2.9)***	(4.1)***	(0.8)	(3.5)***	(3.0)***	(1.0)	(0.7)
Observations	40450	40354	32272	32222	32319	32269	32281	32231	32327	32277
Pseudo R-squared	0.07	0.06	0.09	0.07	0.08	0.07	0.07	0.06	0.18	0.17
Number of clusters	10955	10950	10193	10191	10198	10196	10195	10193	10197	10195
Hansen J-test exog 6 instr.		2.76		7.226		3.861		7.001		6.745
$\chi^2(6)$: p-value		0.838		0.300		0.700		0.320		0.345

Robust t-statistics in parentheses ( ) : individual clustering ; Robust t statistics in brackets [ ] : no individual clustering ; * significant at 10%; ** significant at 5%; *** significant at 1% ; Other controls: same as listed in table 2 (age, urbanicity, family, education, immigration, birth place, year EXCEPT industry, occupation).

Table A1. NPHS Longitudinal Household Component Sample Size by Province in 1994-1995, Number of Persons

		Longitudinal Sample Cycle 1 (1994-1995)	Records providing a full response in Cycles 1, 2, 3, 4 and 5
Newfoundland	Terre-Neuve	1,082	822
Prince Edward Island	Île-du-Prince-Édouard	1,037	803
Nova Scotia	Nouvelle-Écosse	1,085	775
New Brunswick	Nouveau-Brunswick	1,125	824
Québec	Québec	3,000	2,189
Ontario	Ontario	4,307	2,990
Manitoba	Manitoba	1,205	921
Saskatchewan	Saskatchewan	1,168	922
Alberta	Alberta	1,544	1,111
British Columbia	Colombie-Britannique	1,723	1,189
TOTAL	TOTAL	17,276	12,546

	Refusals to 0% of questions	Refusals to less than 1% of questions	Refusals to less than 3% of questions	Don't know to 0% of questions	Don't know to less than 1% of questions	Don't know to less than 5% of questions
Overall	92.3%	98.1%	98.8%	62.6%	93.7%	99.4%
Males	92.2%	97.7%	98.6%	63.7%	93.9%	99.3%
Females	92.3%	98.5%	98.9%	61.6%	93.6%	99.5%
Under 12	94.5%	95.7%	98.0%	82.9%	95.5%	99.5%
12-24	93.2%	98.5%	98.6%	46.5%	88.6%	98.3%
25-44	94.4%	98.9%	99.2%	72.4%	97.6%	99.8%
45-64	92.4%	98.5%	99.0%	65.9%	96.3%	99.7%
65+	86.8%	96.6%	97.9%	48.0%	86.6%	99.0%
Proxy	91.6%	95.9%	97.9%	69.5%	88.3%	98.6%
Non-Proxy	92.3%	98.3%	98.8%	61.9%	94.2%	99.5%

Table A2. Refusal and Don't Know Rates at the Respondent Level. Source: Longitudinal Documentation, ENSP-Cycle 5

Table A3. Regressions for overall workplace stress, additional controls

	1	2	3	4	5	6	7	8	9	10
Dep. variable:					stress_wrk					
EPL_ind	0.246	0.207	0.259	0.222	0.207	0.229	0.238	0.213	0.191	0.189
	(3.3)***	(2.9)***	(3.4)***	(3.0)***	(2.8)***	(3.1)***	(3.2)***	(2.6)***	(2.4)**	(2.3)**
	[3.8]***	[3.3]***	[3.9]***	[3.4]***	[3.2]***	[3.5]***	[3.7]***	[3.0]***	[2.7]***	[2.6]***
EPL_coll	0.021	0.027	0.023	0.025	0.030	0.028	0.025	0.020	0.020	0.026
	(1.4)	(1.9)*	(1.5)	(1.7)*	(2.1)**	(1.9)*	(1.6)	(1.3)	(1.3)	(1.5)
	[1.7]*	[2.2]**	[1.8]*	[2.0]**	[2.4]**	[2.2]**	[1.8]*	[1.5]	[1.5]	[1.7]*
Stresschron		0.633			0.585				0.634	0.556
		(20.3)***			(18.2)***				(20.2)***	(16.9)***
		[21.6]***			[19.3]***				[21.5]***	[18.0]***
Local Unemp. rate								-0.018	-0.015	-0.013
								(1.4)	(0.9)	(0.7)
								[1.6]	[1.0]	[0.8]
Other local controls	No	No	No	No	No	No	No	No	Yes	Yes
Other language (ref: Engl.)							-0.471			-0.497
							(2.0)**			(2.3)**
							[2.2]**			[2.4]**
French language							-0.113			-0.014
							(0.7)			(0.1)
							[0.8]			[0.1]
Support received						-0.760				-0.477
						(9.8)***				(6.2)***
						[10.6]***				[6.7]***
Health				-4.626	-2.589					-2.309
				(9.7)***	(5.7)***					(5.1)***
				[10.4]***	[6.0]***					[5.3]***
Body weight (6 dummy var.)	No	No	Yes	No	Yes	No	No	No	No	Yes
Observations	11472	11447	11224	11420	11151	11265	11472	11472	11447	10962
R-squared	0.08	0.14	0.08	0.10	0.14	0.10	0.08	0.08	0.14	0.15

Robust t-statistics in parentheses ( ) : individual clustering ; Robust t statistics in brackets [ ] : no individual clustering ; * significant at 10%; ** significant at 5%; *** significant at 1% ; Other controls: same as listed in table 2 (gender, age, urbanicity, family, education, immigration, birth place, year, industry, occupation, trauma)

Table A4. Regressions for components of workplace stress, interaction of EPL with local labor markets

Dep. variable: stress from	Work (total)	Skill need	Latitude dec.	Conflicts	Layoff	Phy. exert.	Cowk-manag.	Strain
EPL_ind	0.188	0.081	0.091	0.247	-0.070	0.112	-0.167	0.042
	(1.5)	(1.4)	(2.0)*	(4.8)***	(2.4)**	(3.5)***	(3.0)***	(4.7)***
	[1.7]*	[1.6]	[2.2]**	[5.4]***	[2.7]***	[4.1]***	[3.3]***	[5.2]***
EPL_coll	0.058	-0.001	0.016	-0.031	0.015	-0.011	0.069	-0.002
	(1.7)*	(0.0)	(1.4)	(2.3)**	(2.0)**	(1.3)	(4.8)***	(0.7)
	[1.9]*	[0.0]	[1.5]	[2.6]***	[2.2]**	[1.4]	[5.2]***	[0.8]
Local unemp. rate	0.009	0.048	0.034	0.015	-0.004	0.030	-0.030	0.007
	(0.2)	(2.2)**	(2.0)**	(0.8)	(0.4)	(2.6)***	(1.5)	(2.1)**
	[0.2]	[2.5]**	[2.3]**	[0.9]	[0.4]	[2.9]***	[1.6]	[2.4]**
EPL_ind * u-rate	0.004	-0.008	-0.004	-0.009	0.006	-0.009	0.014	-0.002
	(0.3)	(1.5)	(1.0)	(2.0)**	(2.3)**	(3.0)***	(2.9)***	(2.1)**
	[0.3]	[1.7]*	[1.1]	[2.2]**	[2.6]***	[3.4]***	[3.1]***	[2.3]**
EPL_coll * u-rate	-0.005	-0.001	-0.001	0.001	-0.001	-0.000	-0.004	-0.000
	(1.2)	(0.5)	(1.0)	(0.4)	(0.8)	(0.3)	(2.0)**	(0.7)
	[1.4]	[0.6]	[1.1]	[0.4]	[0.9]	[0.3]	[2.2]**	[0.8]
Trauma	0.300	0.019	0.030	0.081	0.042	0.045	0.106	0.018
	(5.9)***	(0.9)	(1.7)*	(4.3)***	(3.8)***	(3.9)***	(5.1)***	(5.1)***
	[6.8]***	[1.0]	[1.9]*	[4.8]***	[4.1]***	[4.5]***	[5.4]***	[5.6]***
Sex	-0.076	0.553	0.470	0.074	0.092	-0.088	-0.165	0.072
	(0.5)	(8.2)***	(8.7)***	(1.3)	(2.7)***	(2.4)**	(2.7)***	(6.9)***
	[0.6]	[9.4]***	[10.0]***	[1.5]	[3.1]***	[2.8]***	[2.9]***	[7.5]***
Observations	11224	11340	11335	11326	11332	11344	11258	11315
R-squared	0.08	0.32	0.18	0.10	0.06	0.34	0.04	0.11

Robust t-statistics in parentheses ( ) : individual clustering ; Robust t statistics in brackets [ ] : no individual clustering ; * significant at 10%; ** significant at 5%; *** significant at 1% ; Other controls: same as listed in table 2 (age, urbanicity, family, education, immigration, birth place, year, industry, occupation). A higher level of unemployment interact positively with individual EPL on stress associated with the risk of loosing one's job, as expected, and stress due to co-workers and managers. It interacts negatively on physical, psychological stress and stress associated with strain.

Table A5. What determines depression? A first attempt (sc refer to score ; pp to probability ; cf. text)

Dep. variable:	Depress sc	Depress sc	Depress sc	Depress sc	Depress pp	Depress pp	Depress pp	Depress pp
Stresschron	0.149		0.149	0.149	0.022		0.022	0.022
	(14.0)***		(14.0)***	(13.9)***	(14.4)***		(14.4)***	(14.4)***
	[14.9]***		[14.9]***	[14.9]***	[15.0]***		[15.1]***	[15.0]***
EPL_ind	0.003	0.006	0.001	0.005	-0.001	0.001	0.000	0.000
	(0.2)	(0.4)	(0.1)	(0.3)	(0.2)	(0.4)	(0.1)	(0.0)
	[0.2]	[0.5]	[0.1]	[0.3]	[0.2]	[0.5]	[0.1]	[0.0]
EPL_coll	-0.004	-0.001	-0.004	-0.003	-0.001	-0.000	-0.001	-0.001
	(1.1)	(0.5)	(1.1)	(0.9)	(1.4)	(0.9)	(1.4)	(1.1)
	[1.2]	[0.6]	[1.2]	[0.9]	[1.6]	[1.0]	[1.5]	[1.2]
Trauma	0.088	0.121	0.087	0.087	0.013	0.018	0.014	0.013
	(6.7)***	(10.1)***	(6.6)***	(6.6)***	(6.8)***	(10.4)***	(6.8)***	(6.8)***
	[6.9]***	[12.4]***	[6.8]***	[6.8]***	[7.0]***	[12.7]***	[7.1]***	[7.0]***
Sex	0.095	0.124	0.098	0.098	0.017	0.020	0.016	0.017
	(2.7)***	(4.1)***	(2.7)***	(2.7)***	(3.1)***	(4.5)***	(3.1)***	(3.1)***
	[2.9]***	[4.9]***	[3.0]***	[2.9]***	[3.3]***	[5.3]***	[3.3]***	[3.3]***
Local unemp. rate			-0.001	0.003	-0.000			0.000
			(0.2)	(0.8)	(0.8)			(0.3)
			[0.3]	[0.8]	[0.8]			[0.3]
Local activity rate				0.005				0.001
				(1.4)				(1.3)
				[1.4]				[1.3]
Local density				0.000				0.000
				(0.2)				(0.1)
				[0.2]				[0.1]
Local share of male				-1.575				-0.192
				(0.9)				(0.7)
				[0.9]				[0.7]
Population growth 1996-01				-0.001				-0.000
				(0.2)				(0.3)
				[0.2]				[0.3]
Observations	18664	32273	18623	18623	18623	32273	18664	18623
R-squared	0.08	0.04	0.08	0.08	0.07	0.04	0.07	0.07

Robust t-statistics in parentheses ( ) : individual clustering ; Robust t statistics in brackets [ ] : no individual clustering ; * significant at 10%; ** significant at 5%; *** significant at 1% ; Other controls: same as listed in table 2 (age, urbanicity, family, education, immigration, birth place, year, EXCEPT industry, occupation).

Figure 1a: Correlation between workplace stress and EPL. Source: European Quality of Life Survey, 28 countries and 26 000 individuals and Lepage-Saucier and Wasmer (2008).

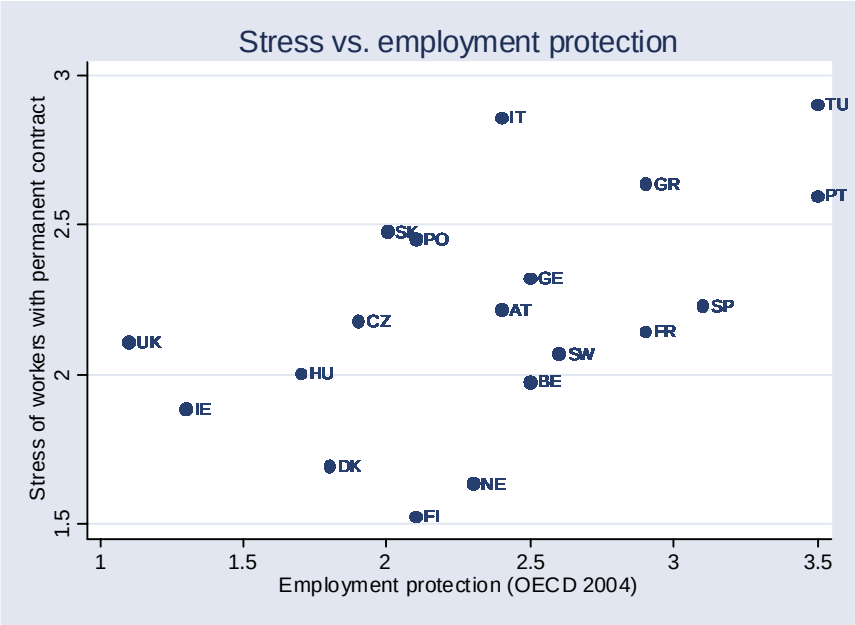


Figure 1b. Cross-country correlation between workplace stress and EPL. Source: International Social Survey Program, 34 835 individuals in 27 countries/areas in the world and Lepage-Saucier and Wasmer (2008).

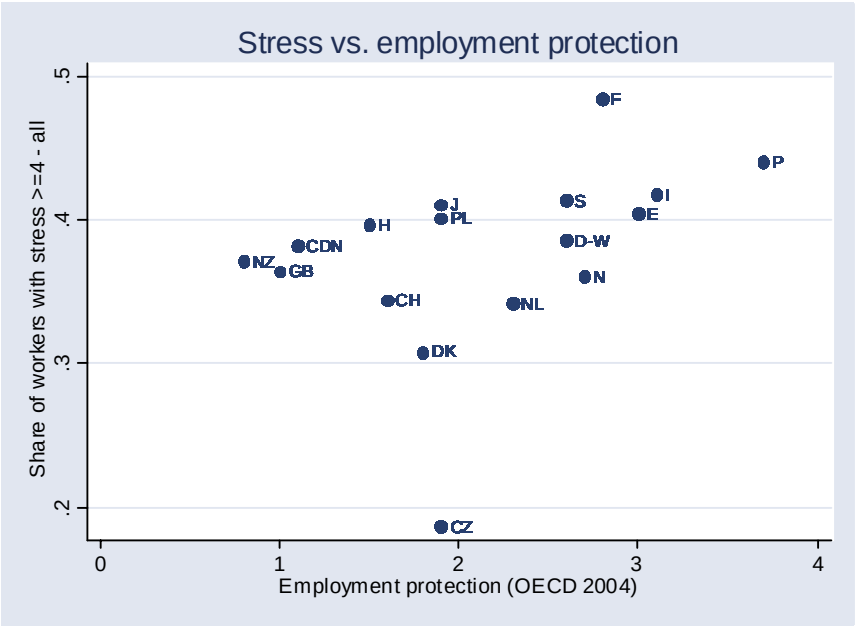
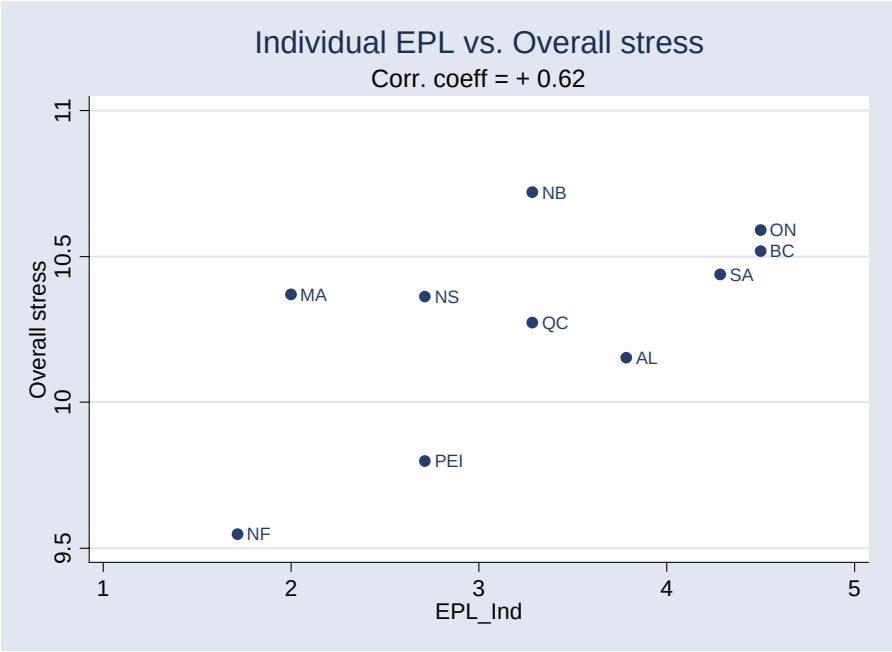
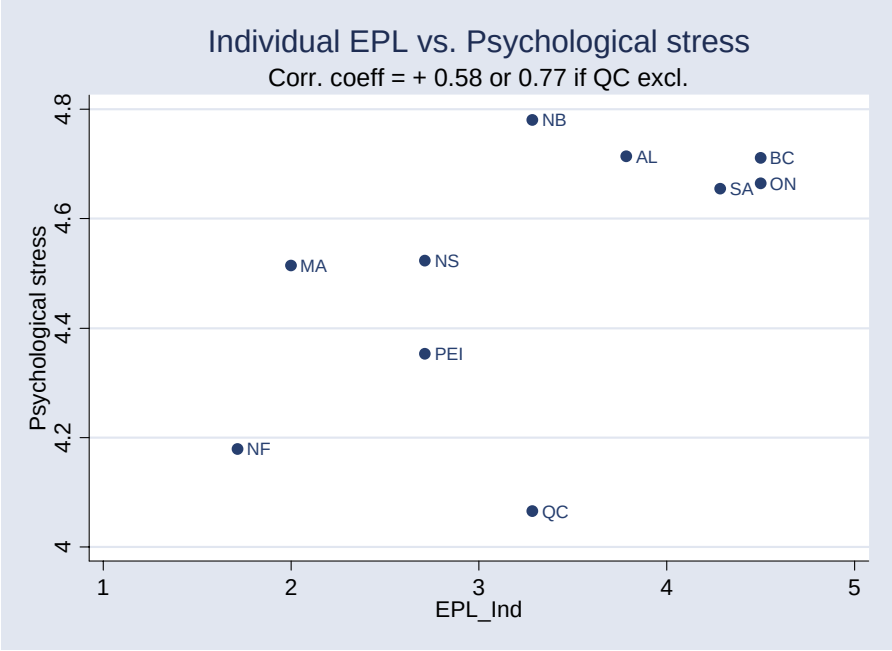


Figure 2. Cross-country correlation between EPL_ind and workplace stress (total)



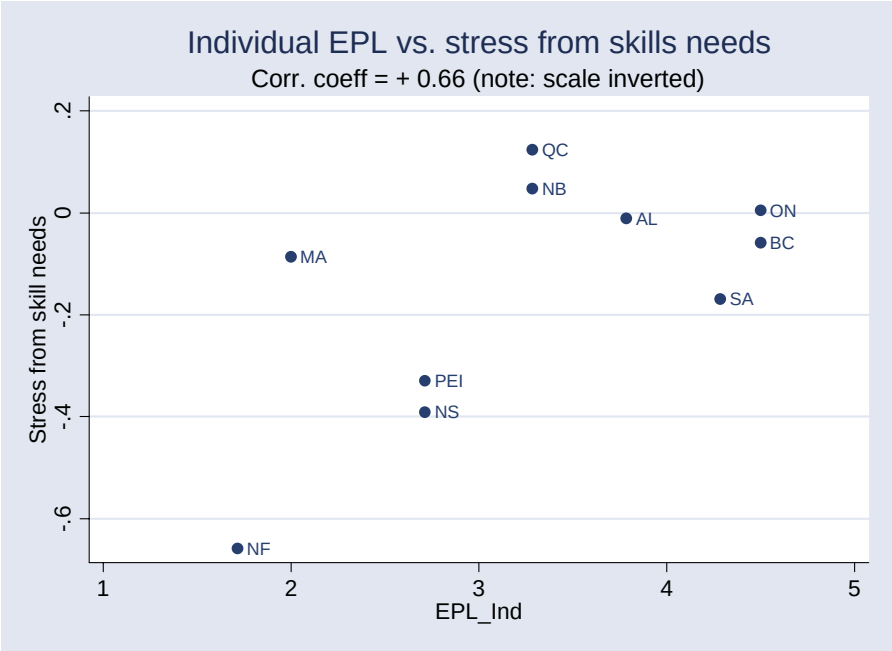
Individual EPL vs. Stress

Figure 3. Canadian provinces, correlation between EPL_ind and Psychological Stress at work. Source: NPHS and author's calculations.



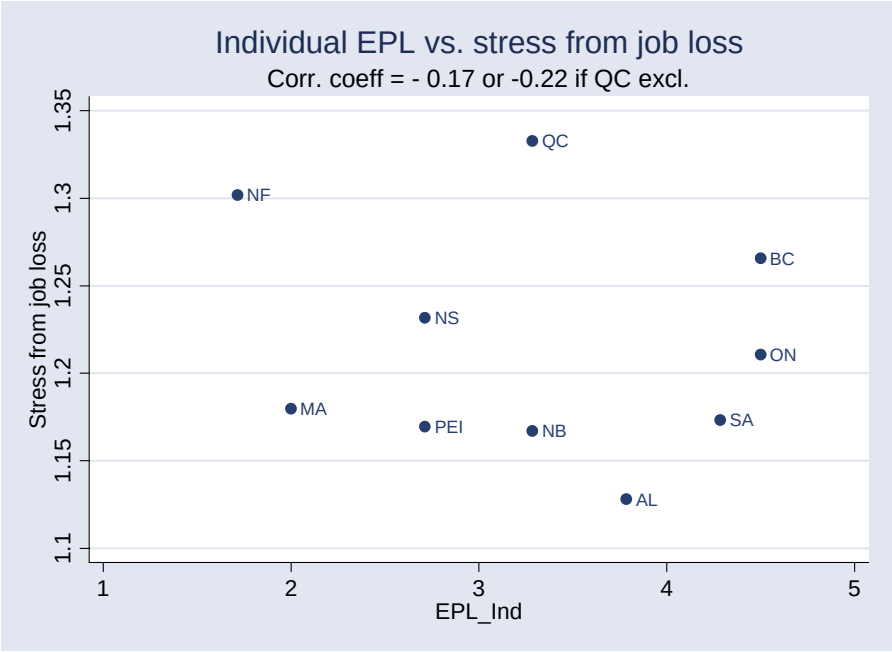
Individual EPL vs. Stress

Figure 4. Canadian provinces, correlation between EPL_ind and Stress from Skill needs at work. Source: NPHS and author's calculations.



Individual EPL vs. Stress

Figure 5. Canadian provinces, correlation between EPL_ind and Stress from Job Loss. Source: NPHS and author's calculations.



Individual EPL vs. Stress

Table B. Notice requirements for termination of employment, various jurisdictions in Canada, 1995.

Individual			Mass	
Jurisdiction	**Length of service**	**Employer notice (wks.)**	**Number of employees**	**Notice (wks.)**
Federal	3 months +	2	50 +	16
Alberta	3 mos - 2 yrs	1	No special provision	
	2 yrs - 4 yrs	2		
	4 yrs - 6 yrs	4		
	6 yrs - 8 yrs	5		
	8yrs-10yrs	6		
	10 yrs +	8		
British Columbia	6 mos - 3 yrs	2	No special provision	
	3 yrs	3		
	1 addit. wk for each addit. yr of employ.-max 8 wks.	8		
Manitoba	1 month +	1 pay period	50 - 100	10
			101 - 300	14
			300+	18
New Brunswick	6 mos - 5 yrs	2	10 or more, if they represent 25% of the employer's workforce	6
	5 yrs +	4		
Newfoundland	1 mo - 2 yrs	1	50 - 199	8
	2 yrs +	2	200 - 499	12
			500+	16
Nova Scotia	less than 2 yrs	1	10 - 99	8
	2 yrs - 5 yrs	2	100 - 299	12
	5yrs-10yrs	4	300+	16
	l0yrs+	8		
Ontario	3 mos - 1 yr	1	50 - 199	8
	1 yr-3yrs	2	200 - 499	12
	3 yrs - 4 yrs	3	500+	16
	4 yrs - 5 yrs	4		
	5 yrs - 6 yrs	5		
	6 yrs - 7 yrs	6		
	7 yrs - 8 yrs	7		
	8 yrs +	8		
Prince Edward Island	6 mos - 5 yrs	2	no special provision	
	5 yrs+	4		
Quebec	3 mos - 1 yr	1	10 - 99	2 mos
	1 yr-5yrs	2	100 - 299	3 mos
	5 yrs-10 yrs	4	300 +	4 mos
	10 yrs+	8		
Saskatchewan	3 mos - 1 yr	1	10 - 49	4
	1 yr - 3 yrs	2	50 - 99	8
	3 yrs - 5 yrs	4	100+	12
	5 yrs -10 yrs	6		
	10 yrs +	8		

Source: Labour Canada, Employment Standards Legislation in Canada.

C Technical Appendix: construction and verification of regional EPL indices

C.1 Construction

To create a single index for individual protection and another one for collective protection against dismissals, I created two grids, common to all provinces: one for seniority (12 categories) and one for firm size (8 categories). I then calculate from table B an average across all lines of the grid of the notice period. Table C provides the averages per province. I thus obtain two indicators of absolute individual and collective EPL. It is interesting to notice that the correlation across regions of the two indicators is not very strong: it is even negative (-0.24). Alternatively, one can build relative indicators of individual and collective EPL, based on the position of each province in the distribution of EPL legislation. They appear to be very correlated with absolute measures, with a correlation coefficient of 0.92, so hereafter I focus only on absolute indicators.

C.2 Comparison

I investigate the impact of these variables on EPL indicators. A crucial question is how to identify the EPL effects, both individual and collective. I can now show a number of correlation indicating that our indicators capture some important dimension of regional labor market conditions. A business report from the Fraser Institute provides indicators of provincial "labour market regulations", including EPL but also various other dimensions of labor relations.[24] Provinces are scored from 0 to 10 on each indicator. A score of 10 indicates an optimal labour law in terms of providing labour-market flexibility. To ease the comparability with our EPL indices, I take a linear transformation of the Fraser Institute indicator, in applying $x \to 10 - x$: a positive correlation coefficient between our EPL index and the Fraser Institute index will thus indicate that two indices are coïncident. The report of Fraser institute in addition reports the ranking of regions (1 for the most flexible to 10 for the less flexible).

I display the correlation matrix between our EPL indices, where EPL_both is the sum of the two EPL indicators and LMR is the index of labor market regulation from Fraser Institute (rk stands for the ranking index and sc for the score). It appears that collective EPL is pretty well correlated with both indicators of the Fraser institute. Individual EPL is positively correlated too but to a lesser extent. Figure C1 confirms that the correlation with the sum of the two indicators is pretty good, especially if British Columbia is excluded from the calculation.

	EPL_both	EPL_ind	EPL_coll	$LMR_{(rk)}$	$LMR_{(sc)}$
EPL_both	1				
EPL_ind	0.1782	1			
EPL_coll	0.913	-0.2387	1		
FI-LMR(rk)	0.515	0.2716	0.3956	1	
FI-LMR(sc)	0.4285	0.1083	0.378	0.9257	1

Note: correlation coefficients between various indicators of EPL

Another check is to correlate EPL indicators with the duration of unemployment spells. Indeed, most existing theory points out that employer will be more reluctant to create jobs and take risks when EPL is more important. I find that the correlation between collective EPL and unemployment duration is

[24] "The Index of Labour Market Regulation assesses several indicators of the provincial labour-relations laws. Specifically, the following aspects of the relation laws are examined: (1) processes of certification and decertification; (2) arbitration process; (3) union security; (4) successor rights; (5) treatment of technology; (6) replacement workers; (7) third-party picketing; and (8) openness of the provincial Labour Relations Boards." Details in Clemens et al. (2003), a report of the Fraser Institute. The website of the institute is presented as follows: "*Established in 1974, The Fraser Institute is an independent public policy organization with offices in Vancouver, Calgary, and Toronto.*"

positive and relatively large, while the correlation between individual EPL and unemployment duration is pretty small and actually negative. The correlation with the sum of the two indicators (EPL_both) is however fairly positive, which is reinsuring. Finally, one can simply calculate the correlation between EPL and union density. Again, there is a clear pattern of positive correlation between collective EPL and union density: the correlation is 0.46 and reaches 0.61 if one outlier is taken away. See also Figure C2.

D Technical Appendix:

D.1 Covariance matrix of error terms with individual and regional clustering

Let first assume that the error term follows

$$\varepsilon_{it} = u_i + e_{it}$$

where i is the individual and t is time, where the ε_{it} is iid. Let us assume two time periods for simplicity of the exposition. The covariance matrix of residuals is then given by:

$$\mathbf{Z}_1 = \begin{pmatrix} \sigma_e^2+\sigma_u^2 & \sigma_u^2 & \mathbf{0} & \mathbf{0} & \mathbf{0} \\ \sigma_u^2 & \sigma_e^2+\sigma_u^2 & & & \\ \mathbf{0} & & \sigma_e^2+\sigma_u^2 & \sigma_u^2 & \mathbf{0} \\ & & \sigma_u^2 & \sigma_e^2+\sigma_u^2 & \\ \mathbf{0} & & \mathbf{0} & \sigma_e^2+\sigma_u^2 & \sigma_u^2 \\ & & & \sigma_u^2 & \sigma_e^2+\sigma_u^2 \\ \mathbf{0} & & \mathbf{0} & \mathbf{0} & \ddots \end{pmatrix}$$

In this case, standard correction techniques available in all softwares apply. The problem becomes more severe with a three-level structure for residuals: I have 2 time observations, 2 regions and n individuals, as follows:

$$\varepsilon_{irt} = v_r + u_{ri} + e_{rit}$$

where $r = A, B$ is a region and v_r is a regional effect, u_{ri} is an individual effect. Assume for simplicity of the exposition that individuals $1, 2$ are in region A and individual 3 in region B. In matricial notations, I have

$$\varepsilon = \begin{pmatrix} v_A + u_{A1} + e_{A11} \\ v_A + u_{A1} + e_{A12} \\ v_A + u_{A2} + e_{A21} \\ v_A + u_{A2} + e_{A22} \\ v_B + u_{B3} + e_{B31} \\ v_B + u_{B3} + e_{A32} \\ ... \end{pmatrix}$$

The covariance matrix then becomes

$$\mathbf{Z}_2 = \begin{pmatrix} \sigma_e^2+\sigma_u^2+\sigma_v^2 & \sigma_u^2+\sigma_v^2 & \sigma_v^2 & \sigma_v^2 & \mathbf{0} & \mathbf{0} \\ \sigma_u^2+\sigma_v^2 & \sigma_e^2+\sigma_u^2+\sigma_v^2 & \sigma_v^2 & \sigma_v^2 & & \\ \sigma_v^2 & \sigma_v^2 & \sigma_e^2+\sigma_u^2 & \sigma_u^2 & \mathbf{0} & \mathbf{0} \\ \sigma_v^2 & \sigma_v^2 & \sigma_u^2 & \sigma_e^2+\sigma_u^2 & & \\ \mathbf{0} & & \mathbf{0} & & \sigma_e^2+\sigma_u^2 & \sigma_u^2 \\ & & & & \sigma_u^2 & \sigma_e^2+\sigma_u^2 \\ \mathbf{0} & & \mathbf{0} & & \sigma_v^2 & \sigma_v^2 \\ & & & & \sigma_v^2 & \sigma_v^2 \end{pmatrix}$$

In that matrix, the dimension of the upper left block is T, the dimension of the 2*2 block is $n_A * T$ that is the total number of observations in region A if n_A is the number of individuals in region A,

etc...One can notably see that

$$\mathbf{Z}_2 = \mathbf{Z}_1 + \begin{pmatrix} \sigma_v^2 * \mathbf{J}(n_A * T) & \mathbf{0} & \mathbf{0} \\ \mathbf{0} & \sigma_v^2 * J(n_A * T) & \mathbf{0} \\ \mathbf{0} & \mathbf{0} & \ddots \end{pmatrix}$$

where $J(p)$ is a square matrix of 1s of dimension p. This additivity may be used to estimate σ_v in a first step, and then obtain corrected s.e. in the second stage. However, given that ρ seem to be small and importantly, of opposite signs across the two waves, I will not investigate this issue further.

D.2 Correction of s.e. of the generated (imputed) regressors

The Little and Rubin's (1987) correction (pp. 256-57) is applied here: let $\widehat{\theta}_l$, $l = 1, .., M$ be the estimated coefficient of EPL in the NPHS regression, when the regressor is obtained from the l^{th} of M bootstrap imputation from the EPA-LFS survey. Let $\widehat{W_l}$ be its estimated variance. The estimate of θ is simply

$$\overline{\theta_M} = M^{-1} \sum_{l=1}^{M} \widehat{\theta}_l \tag{D1}$$

whereas the within-imputation variance is

$$\overline{W}_M = M^{-1} \sum_{l=1}^{M} \widehat{W_l} \tag{D2}$$

The between-imputation component is

$$\overline{B}_M = (M-1)^{-1} \sum_{l=1}^{M} \left(\widehat{\theta}_l - \overline{\theta_M}\right)^2 \tag{D3}$$

and total variance is

$$T_M = \overline{W}_M + \frac{M+1}{M} \overline{B}_M \tag{D4}$$

In our case, $M = 20$. As I impute two variables (EPL_ind and EPL_coll) I adapt equation (D3) so has to transform the scalar $\left(\widehat{\theta}_l - \overline{\theta_M}\right)^2$ into the matrix $\left(\widehat{\theta}_l - \overline{\theta_M}\right)' \left(\widehat{\theta}_l - \overline{\theta_M}\right)$.

In practice, I found that the ratio of the within to the between component is typically very large, that is, about 4500 for the imputation of EPL_ind and 370 for EPL_coll, so that the s.e. in practice differ little from the robust s.e. estimated from GLS: an approximation is

$$\begin{aligned} s.e._{bootsrap} &\simeq \left(\overline{W}_M\right)^{0.5} \left(1 + \frac{\overline{B}_M}{\overline{W}_M} \frac{M+1}{2M}\right) \\ &\simeq s.e._{robust}(1.000016) \text{ for } EPL\_ind \\ &\simeq s.e._{robust}(1.00041) \text{ for } EPL\_coll \end{aligned}$$

Figure C1. Ex-post check of the EPL variables. EPL_ind+EPL_coll vs. Employment Regulation Index

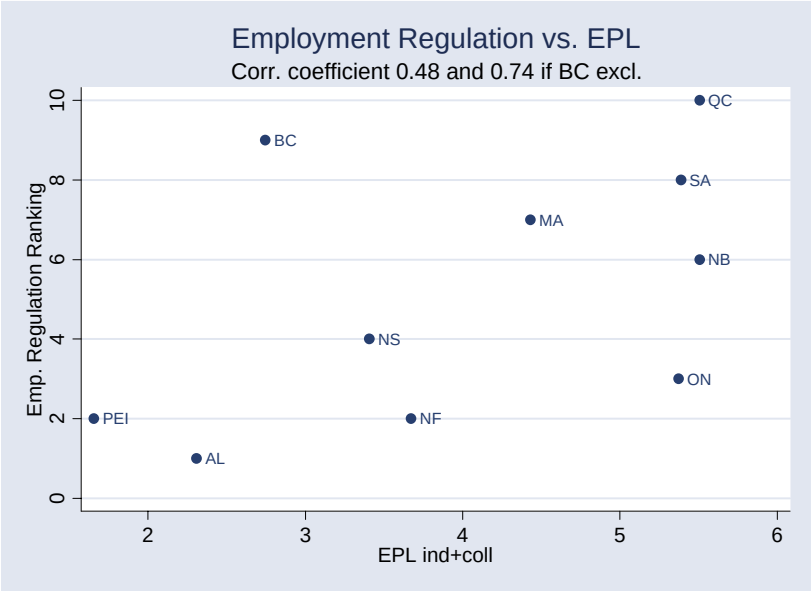
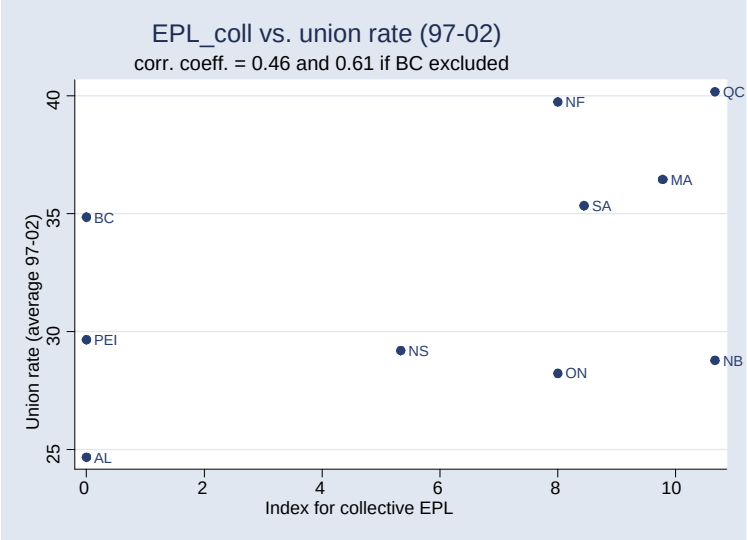


Figure C2. Ex-post check of the EPL variables. EPL_coll vs. union rate



Collective EPL vs. Union density

Table C. Construction of regional indices of EPL

IND	1995												mean	sd
seniority	**Alberta**	**BC**	**Man**	**NB**	**NF**	**NS**	**Ont**	**PEI**	**QC**	**Sask**	**NWT**	**Yuk**		
0,083333333	0	0	2	0	1	1	0	0	0	0	0	0	0,33	0,65134
0,25	1	0	2	0	1	1	1	0	1	1	2	0	0,83	0,71774
0,5	1	2	2	2	1	1	1	2	1	1	2	1	1,42	0,51493
1	1	2	2	2	1	1	2	2	2	2	2	1	1,67	0,49237
2	2	2	2	2	2	2	2	2	2	2	2	1	1,92	0,28868
3	2	3	2	2	2	2	3	2	2	4	3	1	2,33	0,7785
4	4	4	2	2	2	2	4	2	2	4	4	1	2,75	1,13818
5	4	5	2	4	2	4	5	4	4	6	5	1	3,83	1,4668
6	5	6	2	4	2	4	6	4	4	6	6	1	4,17	1,74946
7	5	7	2	4	2	4	7	4	4	6	7	1	4,42	2,06522
8	6	8	2	4	2	4	8	4	4	6	8	1	4,75	2,45412
9	6	8	2	4	2	4	8	4	4	6	8	1	4,75	2,45412
10	8	8	2	4	2	8	8	4	8	8	8	1	5,75	2,89592
12	8	8	2	4	2	8	8	4	8	8	8	1	5,75	2,89592
mean	**3,79**	**4,50**	**2,00**	**2,71**	**1,71**	**3,29**	**4,50**	**2,71**	**3,29**	**4,29**	**4,64**	**0,86**	3,19	1,22865

COLL	1995													
size	**Alberta**	**BC**	**Man**	**NB**	**NF**	**NS**	**Ont**	**PEI**	**QC**	**Sask**	**NWT**	**Yuk**		
0	0	0	0	0	0	0	0	0	0	0	0	0	0,00	0
10	0	0	0	6	0	8	0	0	8	4	0	0	2,17	3,35297
25	0	0	0	6	0	8	0	0	8	4	4	4	2,83	3,24271
50	0	0	10	6	8	8	8	0	8	8	8	8	6,00	3,71728
100	0	0	14	6	8	12	8	0	12	12	12	12	8,00	5,32575
200	0	0	14	6	12	12	12	0	12	12	12	12	8,67	5,54868
300	0	0	14	6	12	16	12	0	16	12	16	16	10,00	6,6606
500	0	0	18	6	16	16	16	0	16	12	16	16	11,00	7,31126
1000	0	0	18	6	16	16	16	0	16	12	16	16	11,00	7,31126
mean	**0,00**	**0,00**	**9,78**	**5,33**	**8,00**	**10,67**	**8,00**	**0,00**	**10,67**	**8,44**	**9,33**	**9,33**	6,63	4,23955
COLL+IND	**3,79**	**4,50**	**11,78**	**8,05**	**9,71**	**13,95**	**12,50**	**2,71**	**13,95**	**12,73**	**13,98**	**10,19**	9,82	4,14956