

N° 114

Juillet 2020

ÉCONOMIE ET STATISTIQUES WORKING PAPERS DU STATEC

Auteur: Robson Morgan

University of Southern California,
Los Angeles, CA, USA. [Present
Affiliation] Minerva Schools at
KGI, San Francisco, CA, USA

Kelsey J. O'Connor

[STATEC] National Institute of
Statistics and Economic
Studies), Research Division,
Luxembourg, Luxembourg.
ORCID 0000-0002-1413-3619

Labor Market Policy and Subjective Well-Being During the Great Recession

Abstract

Subjective well-being decreased in Europe during the Great Recession; however, individuals in some countries fared better than others depending on their labor market policies. For different population subgroups, we assess the moderating roles of two types of unemployment support policies and employment protection legislation. We find both types of unemployment support, income replacement and active labor market policy (which assists the unemployed find jobs), mitigated the negative effects for most of the population (except youth); however income replacement performed better, reducing the impacts of the Recession to a greater degree. In contrast, stricter employment protection legislation exacerbated the negative effects. This finding may be explained with suggestive evidence that indicates: legislation limiting the dismissal of employees curbed increases in unemployment but this benefit was more than offset by increased worry regarding future job prospects; and legislation limiting the use of temporary contracts may have exacerbated increases in unemployment. Our analysis is based on two-stage least squares regressions using individual subjective well-being data from Eurobarometer surveys and variation in labor market policy across 23 European countries.

Keywords: life satisfaction; active labor market policy; income replacement; employment protection legislation; Eurobarometer

Acknowledgements: The authors would like to thank Stefano Bartolini, Andrew Clark, Richard A. Easterlin, Francesco Sarracino, Claudia Senik, and the participants at numerous seminars and conferences for helpful comments. Morgan acknowledges financial support from Minerva and the University of Southern California. O'Connor acknowledge financial support of the Observatoire de la Compétitivité, Ministère de l'Economie, DG Compétitivité, Luxembourg, and STATEC. Views and opinions expressed in this article are those of the authors and do not reflect those of Minerva, the University of Southern California, STATEC, or funding partners. Conflict of Interest: The authors declare that they have no conflict of interest.

1 Introduction

Recessions and financial crises have large negative effects on subjective well-being,¹ which are largely explained by decreased income and increased unemployment (De Neve et al. 2018; Di Tella et al. 2003; Helliwell and Huang 2014a; Montagnoli and Moro 2018; O'Connor 2017a; Wolfers 2003). Unemployment is particularly harmful to subjective well-being. It negatively affects both the unemployed and employed (Arampatzi et al. 2015; Di Tella et al. 2003; Helliwell and Huang 2014a; Luechinger et al. 2010), and individuals' subjective well-being tends not to fully recover after spells of unemployment (Clark et al. 2008). Reducing the impacts of recessions, especially through unemployment, could have long-term, society-wide benefits.

Perhaps the impacts can be moderated by unemployment support or employment protection legislation. Past evidence indicates that social-safety-net policies are positively associated with subjective well-being, generally,² yet that does not specifically answer the question. The evidence also indicates that the association depends on the type of policy. More generous unemployment support programs are related to higher subjective well-being (Boarini et al. 2013; Di Tella et al. 2003; Ochsen and Welsch 2012; Wulfgramm 2014), while stricter employment protection legislation has an ambiguous relation with subjective well-being, sometimes positive (Boarini et al. 2013; Ochsen and Welsch 2012) and sometimes negative (Karabchuk and Soboleva 2019; Scherer 2009). While informative, these studies still do not answer the question. They focus on the different *levels* of well-being associated with different policies between countries at a point in time.³

This paper assesses whether individuals experienced different *changes* in subjective well-being during the Great Recession due to differences in their countries' labor market policies. In particular, we assess the moderating effects of unemployment support and employment protection legislation on the changes in subjective well-being for the entire working age populations (i.e., not only the employed or unemployed) of 23 European countries. Recognizing policies are likely to have heterogeneous impacts, we concentrate our analysis on subgroups defined separately by age

¹ The term "subjective well-being" is used in this paper to refer to either self-reported measures of life satisfaction or evaluative happiness.

² See for example (Boarini et al. 2013; Easterlin 2013; O'Connor 2017b; Pacek and Radcliff 2008; Rothstein 2010); however, the effects may not always be positive (Veenhoven 2000) or equally distributed (Hessami 2010; Ono and Lee 2013).

³ Relations based on policy and subjective well-being levels are often confounded by unobserved characteristics.

and education. Using this approach, we address the question mentioned above. The policies we assess are conceptually well-suited to moderate the effects of the Great Recession, possibly having large impacts on subjective well-being. And our analysis better isolates the ability of labor market policies to moderate the effects of recessions, by focusing on within-country changes in subjective well-being due to the Great Recession.⁴

Subjective well-being is intrinsically important (Frijters et al. 2020; Graham et al. 2018; Helliwell 2019; Kahneman et al. 2004; The Global Happiness Council 2018), but also well suited to assess the economic and non-economic impacts of recessions. Previous studies found recessions to have considerable non-economic costs, which are better measured using subjective well-being than more traditional economic indicators. This is clearly illustrated by comparing the disparate findings of two studies. Lucas (1987) assesses the costs associated with economic cycles in terms of consumption and concludes that the effects are “of second order importance.” In response to this study (and others, e.g. Romer, 1996), Wolfers (2003) uses subjective well-being data and finds, the costs of economic cycles on well-being are much more substantive. Several additional studies confirm this view, finding that the costs of recessions or financial crises extend beyond the loss of income and rising unemployment (Di Tella et al. 2003; Gonza and Burger 2017; Montagnoli and Moro 2018; Sarracino and Piekalkiewicz 2019). As stated by Di Tella, MacCulloch, and Oswald (2003), “standard economics tends to ignore what appear to be important psychic costs of recessions. (pg. 823)”⁵

This study builds on two similar studies. Wulfgramm (2014) shows support for *unemployed persons* reduces the negative effects of becoming unemployed on subjective well-being, using both policy variation between countries at a point in time and variation in policy changes within countries over time. The second study provides similar evidence but for employed persons – unemployment support positively affects the subjective well-being of people who remain employed during economic recessions (Carr and Chung 2014). A limitation of these studies is that they do not evaluate the role of employment protection legislation and they focus solely on the unemployed (Wulfgram) or employed (Carr and Chung). The overall population may face large

⁴ Analyses of changes, as opposed to levels, account for fixed country characteristics (and to a degree stable ones), for instance quality of governance, and concentrating on an unanticipated shock (the Great Recession) largely ensures that the policies were not determined by the shock.

⁵ Sarracino and Piekalkiewicz (2019) focuses on another traditionally non-economic cost, related to social capital.

impacts regardless of labor market status, for instance spouses of the unemployed (Kim and Do 2013). We build on the analysis of Wulgramm and Carr and Chung by estimating the relationships across the entire working age population and by evaluating not only the role of unemployment support but also employment protection legislation. Including employment protection legislation is important first because it is a labor market policy that plausibly played a role in moderating the effects of the Great Recession and second, because including it yields results relevant for the discussion on “flexicurity” (see for example, European Commission 2006). Flexicurity is defined and discussed further in the next section.

Three studies perform similar analysis but instead focus on the moderating role of government more broadly defined. Arampatzi et al. (2019) find that regions in Europe characterized by better quality of governance experienced the negative effects of greater unemployment and financial stress during the Great Recession to a lesser degree. Bjørnskov (2014) provides consistent evidence, that greater legal quality reduced the negative effects of economic crises in Europe. He also shows that regulatory freedom (in the credit, labor and product markets) reduced the effects, but government size, as percentage of GDP, did not. Montagnoli and Moro (2018) find that the negative effects of financial crises on SWB are moderated by government intervention. However, the direction of moderation is not reported, and like Bjørnskov (2014), they use aggregate government figures without distinguishing between expenditure types. While these studies are informative, they address distinct questions and both quality of governance and aggregate government expenditures are insufficient to assess the impacts of labor market policy.⁶

This paper demonstrates subjective well-being dropped significantly during the Great Recession across 23 European countries for the following groups: people with less than a high school education, people with a high school education, youth, and working aged people. Those with a college education were not significantly affected. For the groups that suffered a significant decrease in subjective well-being, with the exception of youth, labor market policies significantly affected the magnitude. However, the effects were not strictly positive. Labor market policies that provided more generous unemployment support significantly mitigated the negative effects of the

⁶ Indeed, Hessami (2010) finds the relation between total government expenditures and subjective well-being is non-linear and depends on quality of governance and the composition of expenditures. In another study, quality of governance is contrasted with social protection expenditures, which includes expenditures on unemployment support, and finds social protection expenditures exhibit a stronger relation than governance quality with subjective well-being (O’Connor 2017b).

Great Recession, while stricter employment protection legislation significantly exacerbated the effects. Further evidence suggests that the exacerbating relationship can be explained in part by stricter employment protection negatively affecting people's perceptions of their future job situation. Many papers discuss perceived unemployment insecurity, which we discuss in the next section.

The remaining of the paper is organized as follows. In Section 2 we discuss our expectations concerning the roles of different labor market policies in moderating the effects of the Great Recession on subjective well-being. We discuss the data in Section 3, including definitions and sources of the labor market policy data. In Section 4 we discuss the methods used to identify the moderating roles of labor market policies. In Section 5 we present and discuss the main results. Robustness tests are also presented in Section 5. In Section 6 we conclude.

2 Conceptual Framework

The Great Recession affected subjective well-being in Europe through multiple channels, with reduced income and increased unemployment likely being dominant, especially unemployment as suggested in the Introduction. Unemployment has one of the larger and more robust negative relations with subjective well-being (Clark 2018). Its effects are larger and longer lasting than income, in part because it operates through both income and non-pecuniary factors – indeed the non-pecuniary effects are larger (Helliwell and Huang 2014b; Winkelmann and Winkelmann 1998) – and unemployment has lasting, potentially scarring effects on individuals (Clark et al. 2001, 2008). It negatively affects the subjective well-being of both the unemployed and those who are not unemployed (Arampatzi et al. 2015; Carr and Chung 2014; Di Tella et al. 2003; Helliwell and Huang 2014b; Luechinger et al. 2010). Helliwell and Huang (2014) conclude that, “more precise estimation and understanding of the indirect effects of unemployment are essential for any cost-benefit analysis of policies designed to mitigate the economic and social effects of unemployment. (pg. 1485)”

With a rise in unemployment likely came a rise in the fear of unemployment or perceived *employment* insecurity, which in turn depends on both *job* insecurity and the costs of being unemployed; these costs are based on future income and reemployment opportunities (Anderson and Pontusson 2007; Bustillo and Pedraza 2010; Green 2009; Green et al. 2000; Luechinger et al. 2010; Silla et al. 2009). Perceived job security may in fact be more important for well-being at

work than actual job security (Origo and Pagani 2009),⁷ and the negative impact can be explained in part by perceived poor employability (Silla et al. 2009), which affects the entire labor force. Perceived employment insecurity partially explains why unemployment rates negatively affect the subjective well-being of the entire labor force (Luechinger et al. 2010). As stated by Di Tella et al. (2003):

“[A]n increase in joblessness can affect well-being through at least two channels. One is the direct effect: some people become unhappy because they lose their jobs. The second is that, perhaps because of fear, a rise in the unemployment rate may reduce well-being even among those who are in work or looking after the home. To calculate the full losses from a recession, these two effects have to be added together (Di Tella et al. 2003, p. 814).”

Unemployment and fear of unemployment are not the only factors that affected subjective well-being during the Great Recession. For instance, declines in income and wealth also likely played a role. Income loss could occur from underemployment, a reduction in aggregate demand for the self-employed, or reduced benefits for the employed. Wealth is a function of obligations, income and market dynamics (e.g., aggregate demand). However, we focus on unemployment and fear of unemployment because they are directly affected by the labor market policies being assessed. What is more, the quote above supports our choice – the “full losses from a recession” are due to both the direct effects and fear of unemployment.

2.1 Expectations Regarding the Moderating Roles of Labor Market Policies

To the extent that labor market policy curbs the effects of the Great Recession, especially increasing unemployment, it will mitigate the effects on subjective well-being.⁸ At the same time, certain policies may exacerbate aspects of the Great Recession. We expect unemployment support policies and employment protection legislation to affect unemployment and fear of unemployment differently as described below.

⁷ Moreover, measures of perceived employment insecurity accurately predict job loss and reemployment outcomes (Dickerson and Green 2012).

⁸ The policies may also affect subjective well-being through income, especially through unemployment support. We treat this channel as a reduction in the cost of unemployment, which we discuss in relation to fear of unemployment.

The moderating role of unemployment support depends on the type. We analyze both net income replacement rates for the unemployed and active labor market policy, which assists unemployed people become reemployed, for instance through placement and training. Both policy types are intended to reduce the costs of being unemployed, thereby mitigating the effects of the Great Recession on subjective well-being for the unemployed and also those who fear unemployment.

Income replacement could also negatively affect well-being, if it sufficiently increased unemployment rates to offset the positive effects discussed above. By providing income support to individuals while unemployed, income replacement may disincentivize individuals from searching for jobs.⁹ This disincentive increases unemployment duration, thereby increasing the unemployment rate; however, this response is due to individuals' choices, not job dismissal. Individuals may observe greater unemployment rates, but also lower labor supply and reduced costs of unemployment. In this context, when increases in unemployment rates are due to reduced costs of unemployment, we suspect that the reduced costs have a larger impact, resulting in a net decrease in the fear of unemployment. Moreover, generous unemployment benefits are not strictly associated with greater unemployment rates around the world (Avdagic 2015; Feldmann 2009).

Empirically, previous findings show unemployment support mitigates the negative effect of unemployment on subjective well-being for both the unemployed (Sage 2015; Wulfgramm 2014) and employed (Carr and Chung 2014).

Consequently, we expect greater unemployment support, in the form of income replacement or active labor market policy, reduced the negative impacts of the Great Recession on the subjective well-being of active age individuals. We also expect the impacts may vary across groups within the population – discussed further in Section 2.2.

Stricter employment protection legislation is expected to have offsetting impacts on subjective well-being, primarily through reduced job dismissals and greater perceived employment insecurity (fear of unemployment). If unemployment during a recession is reduced (through reduced dismissals), then the negative effects of the recession on subjective well-being are reduced. However, at the same time, employment protection legislation reduces employers' ability to adjust their workforce. Such employers may adjust along other margins in times of uncertainty, for instance working hours, benefits, and hiring. The latter is particularly important. Reduced hiring

⁹ Individuals search for jobs more with less generous unemployment benefits and when their benefits are closer to expiring (de Pedraza et al. 2018; Uusitalo and Verho 2010).

means fewer vacancies. Through this channel, stricter employment protection decreases employment security for everyone not protected, notably the unemployed and those not on permanent contracts.

Stricter employment protection legislation may also lead to greater unemployment rates, as suggested by some of the previous research (e.g., Botero et al. 2004; Feldmann 2009). This is plausible given changes in vacancies may better explain changes in unemployment rates than dismissals (Fujita and Ramey 2009; Shimer 2005, 2012). Further support includes the finding that stricter employment protection is related to negative feelings of job security (Clark and Postel-Vinay 2009), and stricter regulations (on capital, labor, and product markets) exacerbated the effects of past crises on subjective well-being in Europe (Bjørnskov 2014). However, not all studies find stricter employment protection legislation is associated with higher unemployment rates (e.g., Avdagic 2015; Vergeer and Kleinknecht 2012).

A related set of literature examines “flexicurity” as a system of employment support. Flexicurity can be described by the so called golden triangle, which includes high labor market flexibility (e.g., lax employment protection legislation), a generous welfare system (especially unemployment benefits), and generous active labor market policy (Madsen 2002; Pedraza et al. 2019). It is modeled on the Danish system. Under this system, one might expect that lax employment protection legislation would cause individuals to perceive low job security, but previous research suggests that need not be the case.¹⁰ Indeed, as Madsen explains, the Danes somewhat surprisingly feel more security than all of the other sample countries (Madsen 2002). Perhaps this result is not surprising if one distinguishes between subjective *employment* and *job* security (as in Green 2009). Flexicurity emphasizes the former. Under a flexible regime, job dismissals are relatively high but so are vacancies. This system benefits employers, but through higher vacancies, also the unemployed and employed seeking new jobs.¹¹ Under flexicurity, if one loses their job, the costs are relatively lower, receiving the benefits of a generous welfare system, assistance finding a new job, and a greater number of vacancies to choose from – thus providing employment security.

In the context of this paper, flexicurity can be characterized as the combination of lax employment protection legislation and generous unemployment support. It represents only one set

¹⁰ Indeed, perceived job security is more important than contract type for job satisfaction (Origo and Pagani 2009).

¹¹ The effects of flexibility are not strictly positive; it may also reduce job satisfaction (Böckerman et al. 2011).

of the policies analyzed. For this reason, we do not explicitly focus on flexicurity. Nevertheless, our results have implications for the discussions of European labor market policy in which flexicurity has figured prominently (European Commission 2006).

The net impact of employment protection legislation on subjective well-being during the Great Recession depends on whether the positive effects through reduced job dismissals dominate the negative effects through perceived employment insecurity and reduced benefits.

2.2 Heterogeneous Impacts by Education and Cohort

We analyze the impacts of the Great Recession and moderating role of labor market policy on groups disaggregated by age and education (discussed further in the next section).

Labor market policies should have the largest impacts on vulnerable groups that would have otherwise been affected most by the labor market effects of the Great Recession (e.g., lesser educated and youth); however, individuals also need to be eligible to directly receive benefits. For example, to be eligible for unemployment benefits, one needs to be previously employed for a minimum period. Consequently, we expect the mitigating role of unemployment benefits to be increasing in both the vulnerability and eligibility of the group.

The heterogeneous effects of employment protection legislation depend on the type of employment protection. We examine two forms. The first legislation makes it more costly for employers to dismiss employees on permanent contracts (referred to as EPL). EPL benefits those on permanent contracts, but as discussed above, may also reduce vacancies. Fewer vacancies affects the entire labor force, but especially those seeking jobs on permanent contracts (whether employed or unemployed). Consequently, EPL has offsetting effects for those on permanent contracts and negative effects on both employees on temporary contracts and the unemployed.

The second form of employment protection legislation regulates the use of temporary contracts (referred to as EPL-T). Intended to incentivize permanent contracts, stricter EPL-T reduces the number of temporary ones. The benefits accrue to those who receive permanent contracts, while the costs, through fewer vacancies, affect the entire labor market, especially those seeking positions on temporary contract.

3 Data

To assess the role of labor market policies during the Great Recession, we use individual subjective well-being data and macro data collected from 23 countries in Europe¹². Two periods are used, corresponding with the pre-recession peak and the recession trough. In particular, the micro data are from the latter half of 2007 and middle of 2009 based on the available measures closest to the peak and trough business cycle dates from the Center for Economic Policy Research: Business Cycle Dating Committee. Individuals aged 15 to 64 are included. We exclude those who are 65 and above because 65 is a common retirement age in Europe. The macro data is similarly obtained for periods as close to the peak and trough periods as possible, using quarterly-macro data when available and yearly otherwise.

Subjective well-being is measured as the response to the question: “On the whole, are you very satisfied, fairly satisfied, not very satisfied, or not at all satisfied with the life you lead? Would you say you are?” (coded 4-1, with 4 being very satisfied and 1 being not at all satisfied). We refer to this variable as life satisfaction. These data are obtained from the Eurobarometer (European Commission 2007, 2009) and are nationally representative with weighting.¹³

The macro data consist of both economic and labor market policy variables. The economic variables include the natural log (ln) of GDP per capita, unemployment rate, and inflation rate. They are obtained from the OECD (2014a). Four labor market policy variables are used, which can be divided into two broad categories. The first includes policies that provide support for people who become unemployed, which can be further subdivided into two types of unemployment support – programs that assist unemployed workers to find employment (active labor market policy) and income replacement for people who become unemployed (net income replacement). The second broad category includes policies that restrict the ability of firms to freely adjust their workforce (employment protection legislation), which in turn differs for fixed term and non-fixed term contract workers.

Labor policy variables are constructed by the OECD to make them as comparable as possible across countries. They are defined as follows:

¹² The largest samples of countries with requisite data are used. See Appendix Table 5 for the full country listing and policy indicator details.

¹³ We apply post-stratification weights when performing regressions. Provided by Eurobarometer, the weights adjust the sample to be representative of the national population along the dimensions: gender, age, and region.

- Net replacement rate (NRR) measures the average proportion of net in-work income that is maintained for 60 months when someone becomes unemployed (OECD 2014b). NRR is measured on a scale of 0-100.
- Active labor market policy (ALMP) is the percent of GDP spent on active labor market policy (OECD 2014c). Active labor market policy is defined as programs that help unemployed people find new jobs. This includes job placement services, benefit administration, job training, and job creation programs. Because unemployment and GDP changed during the Great Recession for all countries, the active labor market policy variable is converted to expenditure per unemployed person in 2005 measured in thousands of 2005 US dollars.
- Employment protection legislation (EPL) is a synthetic measure from 0 to 6 that reflects the strictness of regulations governing the dismissal of workers in non-fixed contract jobs. It covers regulation of individual and collective dismissals (OECD 2014d). Greater values correspond to stricter regulation.
- The employment protection summary indicator for temporary work (EPL-T) covers fixed term contract jobs (OECD 2014d). It is a measure of how freely firms can use fixed term contracts, that is, it reflects how many times firms can renew fixed term contracts, the types of jobs firms can use fixed term contracts to hire workers, and also regulations on the duration of fixed term contracts. EPL-T is also measured on a 0 to 6 scale, with greater values corresponding to stricter regulations.

Samples vary by analysis based on data availability. The largest possible samples were used, but labor policy variables are not uniformly available. Analysis using NRR is conducted on the full sample of 23 countries. For ALMP, 19 countries are used. For EPL and EPL-T a different set of 19 countries are used. See Appendix Table 5 for a list of countries and policy indicator values when available.

4 Methods

Before assessing the role of labor market policy, we first determine whether the Great Recession affected different population groups differently. We expect there to be heterogeneous impacts consistent with the results of previous studies (e.g., Bell and Blanchflower 2011; O'Connor

2017a).¹⁴ We focus on groups defined by education and birth cohort because their compositions should not depend much on the Great Recession.¹⁵ In particular, three groups are defined by educational attainment, including: less than a high school education, a high school education, and a four-year college degree or more. The high school group includes trade school because a small percentage of people fall into this category. When performing the analysis by education, we exclude students from the sample because their final level of educational attainment is unknown. Birth cohort is also divided into three groups defined by age during the peak period, including: youth, 15 to 24 years of age; middle ages, 25 to 44; and older age, 45 to 64. The analysis by cohort includes students.

To identify the moderating role of labor policies on the changes in life satisfaction during the Great Recession, we use the following specification:

$$LS_{igt} = \alpha + \sum_{g=1}^3 \delta_g group_g X trough_t + \sum_{g=1}^3 \gamma_g group_g X trough_t X policy_j + \beta_0 Y_{jt} + \beta_1 X_{ijt} + c_j + group_g + \varepsilon_{igt} \quad (1)$$

Where LS_{igt} is life satisfaction for individual i , in group g , in country j , at one of two times t (peak or trough); $group_g$ are group dummy variables; $trough_t$ is a dummy variable that takes the value of 1 in the trough period; $policy_j$ represents one of the labor policy variables; Y_{jt} is a vector of macroeconomic variables that capture the intensity of the recession, including ln GDP per capita, inflation rate, and in certain regressions, the unemployment rate; X_{ijt} is a vector of micro controls, including: employment status (in certain regressions), marital status, gender, age (when estimating effects by level of education), and level of education (when estimating effects by cohort); and c_j are country fixed effects. δ_g represents the conditional mean change in life satisfaction for each group; we expect it to be negative but different for each group. The

¹⁴ Montagnoli and Moro (2018) find differences in statistical significance across population subgroups, but not point estimates.

¹⁵ The biggest change in composition was relatively small. From peak to trough, the student population share decreased on average by an amount of less than three percentage points. The next biggest change was for college graduates, who increased as a share by approximately 1.3 percentage points. Analyzing the effects on groups with changing compositions, such as the unemployed, reduces the ability to compare these groups across countries and external validity. The unemployed are selected differently in different countries depending on the depth of the recession as well as labor market institutions.

moderating effect of policy is given for each group by the coefficients γ_g on the interaction term $group_g \times trough_t \times policy_j$. A positive (negative) γ_g indicates a mitigating (exacerbating) role of a policy on the change in life satisfaction.

Equation (1) accounts for many potential sources of bias primarily by including country fixed effects. All fixed country characteristics and any that are slow to change, such as quality of governance, are captured, which includes the initial policy levels (or main effects). Over the short period from recession peak to trough, the policies were not changed substantively on average. The correlations for each policy indicator between measurement dates are quite high, the lowest being 0.94, as shown in Appendix Table 5.

We also allow $group_g \times trough_t \times policy_j$ to be endogenous using two-stage instrumental variable methods. In particular, $policy_j$ takes the trough policy value and is predicted using the corresponding policy variable from the peak period. More precisely, the policy interaction terms $group_g \times trough_t \times policy_{j=trough}$ are predicted in the first stage using $group_g \times trough_t \times policy_{j=peak}$. Then the second stage regression is performed on equation 1 replacing the endogenous variables with the predicted variables. Of the two instrumental variable conditions, relevance is clearly met. Validity is not testable, but we provide reassurance using an overidentification test in robustness Section 5.4. Moreover, validity is plausible. Peak policy conditions existed prior to the Great Recession and are not likely to have been determined by the recession itself because it was unexpected by policymakers. It is possible that peak policy is not excludable – that an omitted variable moderates the subjective well-being decline through peak policy rather than trough policy; however, we also believe this concern to be minimal, because current policy (trough) is more important for an individual than past policies (peak). Current policies play an important and direct role in individuals' lives when they are needed. While past policies might inform individuals' beliefs about the macro conditions present in society (e.g., through the media), the direct impacts are far more important. In a seminal study Hadley Cantril found that individuals in diverse countries around the world are more concerned with factors present in their daily lives than more abstract concerns (Cantril 1965). We also control for time-varying micro and macro conditions, especially those communicated by the media (i.e., GDP and the unemployment rate), which should capture what individuals are most concerned about.

We perform the estimation using two stage least squares (2SLS). While the second stage ordinary least squares (OLS) regression treats life satisfaction as cardinal, previous results have

shown that the difference between treating subjective well-being as cardinal or ordinal makes little difference to the estimates (Ferrer-i-Carbonell and Frijters 2004). Moreover, OLS is preferred for interpretation of the results. We further discuss the cardinal treatment of life satisfaction and test the robustness of our main results to ordinal treatment in the Appendix.

We assess statistical significance using Wild Cluster Bootstrap methods. Clustering standard errors at the country level is necessary because policy variation occurs at the country level, meaning error terms within a country are not independent. Bootstrap methods are necessary because the number of countries is small. Previous work has demonstrated that a small number of clusters leads to rejecting the null hypothesis relatively more frequently, in some cases at more than double the critical value (Bertrand et al. 2004). To address this problem Wild Cluster Bootstrap methods are used (using 399 replications). The limitation is that only p-values from the bootstrap distribution can be obtained.¹⁶ For this reason, the bootstrapped p-values are reported in the tables. For a further explanation of Wild Cluster Bootstrap methods see (Cameron and Miller 2015); when using instrumental variables, see (Davidson and Mackinnon 2010); and for implementation using STATA, see (Roodman et al. 2018).

5 Results

Before assessing the role of labor market policy, we first estimate the heterogeneous impacts of the Great Recession on life satisfaction. Figure 3 plots the level of life satisfaction during the peak and the trough disaggregated by education and birth cohort. Among the education groups, the group that suffered the largest drop in life satisfaction was those with less than a college degree. All birth cohorts suffered a significant drop in life satisfaction, with the largest being experienced by the youth (less than 25 years old at peak).¹⁷ The magnitudes were generally large too. For those groups experiencing a statistically significant drop, the size is at least as large as the average

¹⁶ Standard errors cannot be estimated using this method because it includes asymptotic refinement (sample estimates approach the population values at a faster rate), which can only be performed on statistics that do not depend on unknown parameters.

¹⁷ The results contrast those of Montagnoli and Moro (2018) somewhat, who find youth (ages 13-27) did not experience a significant decline. This difference could be due to the difference in age ranges. In any case, they find no statistical differences across groups and the other groups experienced significant declines.

difference in life satisfaction between people with and without a high school degree (during the peak period).

(insert Figure 1 here)

5.1 Policy Effects By Level of Education and Cohort

The results in Table 1 present the moderating policy effects for groups defined by level of education, while Table 2 presents the relations by birth cohort. In line with expectations, unemployment support policies generally mitigated the effects of the Great Recession on life satisfaction. As can be seen in column 1 of Tables 1 and 2, the effects of NRR are positive and significant for those with less than high school or high school education, and the cohorts aged 25-44 or 45-64. The effects of ALMP (column 2) are positive and significant for those with a high school education and the cohort aged 45-64. Among unemployment support policies, the results imply that NRR was more effective than ALMP in reducing the effects of the Great Recession, based on the size (contrast the beta coefficients) and number of significant relations. This result was not necessarily anticipated – it was unclear beforehand which set of policies would be more effective at reducing the perceived and realized costs of unemployment. Recall however that the sample varies across policies, meaning comparisons are not conclusive.

In stark contrast, stricter employment protection legislation significantly exacerbated the negative effects of the Great Recession on life satisfaction, as shown by the negative and significant relations presented in columns 3 and 4 (Tables 1 and 2). Both EPL and EPL-T had negative effects for each group, except for youth aged 15-24 (EPL and EPL-T) and the college educated (EPL). With unemployment controls omitted (both micro and macro), the coefficients reflect the net effect of both channels discussed in Section 2, unemployment and fear of unemployment. The negative net effect, implies that any positive effect through reduced dismissals is more than offset through the effects of fear of unemployment.

(insert Table 1 here)

(insert Table 2 here)

The magnitudes are meaningful as well. To interpret them, standardized beta coefficients and the mean change in life satisfaction by group and are presented. For example, in Table 1 column 1, for the two lower educated groups, a ten percentage point increase in NRR would increase life satisfaction by approximately 0.08 points on a scale from 1 to 4, which would mitigate approximately two thirds of the impact of the Great Recession for the less than high school group or all of the impact for the high school group. In Table 1 column 3, a one standard deviation increase in EPL would reduce life satisfaction by approximately 0.12 points for the less than high school group, which is approximately the same as the decrease in life satisfaction experienced by the group in this sample. Contrasting the beta coefficients across policies suggests NRR has the largest impact, though again the samples vary and such a comparison is not conclusive.

Different relations by group result in part from different group vulnerability and policy eligibility, consistent with expectations. Individuals with less education (both less than high school and high school) experienced greater declines in life satisfaction and larger policy effects (contrast beta coefficients). Of the two groups, the moderating effects were somewhat larger for the high school group even though they had smaller declines, which is plausible, assuming high school graduates are more likely to be eligible for benefits. In fact, the moderating effect of ALMP was insignificant for those with less than a high school education. It may be the case that a base level of education is necessary to benefit from ALMP programs (e.g., placement and training). The college educated, were not statistically affected by NRR, ALMP, or EPL. This result is likely because their life satisfaction was not significantly affected by the Great Recession (cf., Figure 1). It may have also been the case that the college-educated group paid higher taxes associated with more generous policies, which offset the otherwise positive effects experienced by the other groups.¹⁸ In any case, the net effect on the college-educated was insignificant.

By cohort, youth (15-24) life satisfaction was not significantly moderated by any of the policies assessed. As one of the groups most affected, this is an important finding, however plausible. NRR and ALMP likely had no effect on the youth because in all sample countries, to qualify for unemployment benefits a person must contribute to the state for a minimum number of months. Likewise, the insignificant relationship of EPL can be explained by the fact that EPL applies to longer-term jobs, for which youth may not yet qualify. What is more surprising, is that EPL-T also

¹⁸ Indeed, Ono and Lee (2013) present evidence that happiness is redistributed by welfare-state policies from “low-risk to high risk individuals.”

did not affect youth life satisfaction, because EPL-T applies to fixed term work. Perhaps the Great Recession affected youth life satisfaction primarily through channels other than the labor market. For the older cohorts, the eldest (45-64) experienced greater moderating effects of NRR, ALMP, and EPL, presumably because more of them were eligible for benefits. EPL-T, on the other hand, is more likely to affect those seeking jobs without permanent contracts, i.e., the middle-age compared to the older cohort.

5.2 Explaining the Effects of Employment Protection Legislation

On net, employment protection exacerbated the impacts of the Great Recession on life satisfaction; however employment protection could have had both positive and negative moderating effects by curbing unemployment but also by increasing fear of unemployment, as described in Section 2. In this section we assess both channels.

5.2.1 Benefits From Reducing Unemployment?

To assess the potential mitigating role of employment protection on unemployment, we rerun the benchmark analysis including unemployment controls (micro and macro). When including unemployment controls the estimated effects of EPL and EPL-T represent the effects after separately accounting for unemployment. If indeed EPL and EPL-T have positive moderating effects operating through a reduction in dismissals, then the relations will have larger negative magnitudes.

Table 3 presents the results. When unemployment controls are included, the coefficient magnitudes for EPL are larger. This finding supports the view that EPL curbed unemployment and through this channel mitigated the negative effects of the Great Recession on life satisfaction; this also implies that the exacerbating role of EPL operated through something other than unemployment, plausibly fear of unemployment. In contrast, the EPL-T magnitudes do not change in the expected way. The exacerbating effects of EPL-T become statistically insignificant when unemployment controls are included. This finding implies EPL-T negatively affected life satisfaction directly through increased unemployment rather than fear of unemployment. However, the result is not surprising considering EPL-T does not directly limit the ability of firms to dismiss employees, but instead limits their ability to use fixed term contracts. This constraint likely reduces hiring and vacancies, especially during uncertain economic periods like the Great Recession. What

is more, it has been found before that stricter unemployment protection legislation is associated with greater unemployment (e.g., Botero et al. 2004; Feldmann 2009), though not all studies agree (e.g., Avdagic 2015; Vergeer and Kleinknecht 2012). Note, the results suggest EPL-T also exacerbated fear of unemployment, but only for the cohort aged 25-44 (column 8), which makes sense as a group that is more likely to take temporary contracts compared to the older cohort.

(insert Table 3 here)

5.2.2 Cost of Labor Market Rigidity - Negative Feelings About Future Job Situation

We expect stricter employment protection to have negatively affected individuals' fear of unemployment in part through their perceptions of reduced employment opportunities. As discussed in Section 2, fear of unemployment depends on perceived job security and the costs of unemployment, which includes reemployment opportunities. To test this expectation, we introduced a new dependent variable reflecting how people feel about their job situation in the next 12 months. The variable is based on responses to the question, "What are your expectations for the next twelve months: will the next twelve months be better, worse or the same, when it comes to [Your personal job situation]?" The variable takes the value of 1 if the respondent chooses "worse" and 0 otherwise. Using this outcome variable we rerun the regressions using the same specification for the analyses presented in Tables 1 and 2. The second stage is OLS as before, meaning the regression coefficients reflect changes in the probability an individual reports they believe their job situation will get worse due to changes in the independent variables. The analysis uses a slightly smaller sample because some individuals in the main sample did not answer the job situation question.

The results are presented in Table 4. Stricter EPL significantly increased negative feelings about job prospects for people with at least a college education and those aged 45 – 64 (columns 1 and 2), but did not significantly impact the other groups' job concerns. The results are plausible when considering the better educated and older groups are more likely to be on permanent contract and subject to EPL. The fact they feel negatively about their job prospects means that the protections from dismissals are outweighed by fear of unemployment and possibly declining working conditions and benefits. As mentioned, under EPL and times of uncertainty, employers may adjust along different margins and reduce hiring, affecting most those individuals who would seek jobs on permanent contract. It is not clear why EPL did not significantly affect the perceptions of other

groups, except perhaps that they are less likely seeking positions covered by EPL. EPL-T did not have a significant effect on individuals' perceptions of job situation, which is consistent with the findings from Table 3 that suggest EPL-T affected individuals primarily through unemployment.

(insert Table 4 here)

Collectively the results of Tables 3 and 4 help to explain why stricter employment protection is related to larger declines in life satisfaction. The results in Table 3 illustrate that the exacerbating effects of EPL do not operate through unemployment, they are in fact larger when controlling unemployment, and in Table 4, EPL is shown to negatively affect individuals' feelings about their future job situation (specifically, the college educated and those aged 45-64). The effects of EPL seemingly result from greater rigidities in the labor market. With greater rigidities, firms reduce hiring in times of uncertainty, and individuals face greater costs of unemployment.

The results for EPL-T instead suggest it negatively affects life satisfaction by directly increasing unemployment. In Table 3, the exacerbating effects of EPL-T become insignificant when controlling for unemployment, and in Table 4, EPL-T does not affect individuals' feelings about their job situation.

5.3 Robustness Checks

In this section we support the validity of the instrumental variable approach, assess the robustness of the results to an ordinal treatment of life satisfaction, and provide evidence that the results are not too sensitive to country selection.

In order for the instrumental variable approach to be valid, policies measured during the peak period must affect life satisfaction solely through the policy variable measured in the trough period. As discussed in the methods section, there is good reason to support this view. It is unlikely that policy makers changed labor market policies in anticipation of the Great Recession (indeed policy indicators are nearly the same in each period, cf., Appendix Table 5). Nevertheless, we assess whether the peak policy variables are valid instruments using overidentification tests. The overidentification test results, presented in Appendix Table 6, support our claim that the instruments are valid. For each policy, we fail to reject that the instruments are valid. In order to conduct the overidentification test, additional instrumental variables are necessary. Details are discussed in the Appendix.

Readers may be concerned that the cardinal treatment of life satisfaction affects the results. To test the robustness of our main results to this treatment, we conduct two analyses that treat life satisfaction as ordinal, ordered probit and linear probability (compressing life satisfaction to a binary indicator). Further details are included in the Appendix. The results, presented in Appendix Table 7, are qualitatively similar to the main results. Estimates from each of the ordered probit regressions are consistent with the main analysis in direction and significance. The linear probability model estimates are generally consistent as well; however, there are two exceptions: the most important of which is the direction and significance of the effects of ALMP by education. See the Appendix for further details. These results should be considered when interpreting the ALMP estimates. Otherwise, the main conclusions are robust.

Another concern is that the results depend on the sample of countries. We use the greatest number of countries for which life satisfaction and policy data are available, which causes the country samples to differ across policy measures. As a reminder, Appendix Table 5 summarizes the policy variables and illustrates which countries are in each sample. The samples are also comprised of a small number of countries, meaning that the impact of one country's policy could greatly influence the estimates. A country could be an outlier because of an unusual experience during the Great Recession or because their policy was measured differently than in the other countries.¹⁹ Although the small number of countries (clusters) challenge is directly addressed using the Wild Cluster Bootstrap method, which improves consistency and greatly reduces the influence of outliers, this method may not be very intuitive.

To further assess whether the main results are sensitive to country sample, we repeatedly rerun the main analysis omitting one country at a time. If the resulting estimates, one for each country, are not significantly different from the main results, then we can conclude the results are not sensitive to the inclusion of one country or another.

The results from this exercise are presented graphically in Figures 4 and 5. In each graph, the dark horizontal lines represent the original estimate of the policy effects on peak to trough change in life satisfaction for each group. The points in each graph represent new estimates when omitting the labeled country. Confidence intervals at the 90% level are included for each new estimate.

¹⁹ The OECD was very careful to make policy variables comparable across countries, but there are differences in policy implementation across countries that are potentially missed by the policy variables included in this study. One example is the strictness of regulations governing access to benefits, which is not considered in NRR and ALMP.

The results from Figure 2 and 3 show that in the vast majority of times a country is omitted, the estimates do not significantly differ from the estimates presented in Tables 1 and 2. Furthermore, the statistical significance of the estimates rarely change when omitting a country. For example, in Figure 2, Panel A, Less than High School, omitting Greece does yield a significantly lower estimate, but one that is still statistically different from zero. Occasionally an estimate is not statistically different from zero, but in each case it is not statistically different from the main result either.

(insert Figure 2 here)

(insert Figure 3 here)

The estimates for NRR and ALMP are not too sensitive to omitting countries.²⁰ The estimates of the effects of EPL are somewhat sensitive to the inclusion of Ireland and Great Britain, and Turkey for EPL-T's estimates. In Figure 2, Panel C (EPL), Ages 15 – 24, omitting Ireland or Great Britain yields insignificant estimates. In Figure 2, Panel D (EPL-T), omitting Turkey in any age group yields insignificant estimates. Interestingly, the estimate decreases for those with the less than a high school education, but increases for each other group by education. In Figure 3, Panel C (EPL), Ages 25 – 44, omitting Ireland reduces the precision, yielding an insignificant result. In Figure 3, Panel D (EPL-T), omitting Turkey again greatly reduces the precision across all groups. Future research should look further into EPL-T in Turkey.

Although some estimates for EPL and EPL-T are sensitive to country selection, the results from the Wild Cluster Bootstrap methods provide a consistent story. Consider, Figure 3, Panel D (EPL-T), Ages 15 – 24, omitting Turkey yields a highly insignificant result, yet when omitting the other countries, the estimates are marginally significant. In this case, the regression results using bootstrapping are insignificant (Table 2, column 4). In contrast, in Figure 3, Panel C (EPL), Ages 25 – 44, the estimates are more significant (except when omitting Ireland), and as a consequence, the bootstrapped regression results are significant (Table 3, Column 3).

²⁰ Omitting Netherlands causes the estimated effects of ALMP to increase; however, the change is not generally statistically significant.

6 Conclusion

This study contributes to our understanding of how labor market policy can mitigate, or exacerbate, the negative effects of a recession on well-being. The Great Recession had significant negative effects on the subjective well-being of nearly every population group assessed. Those with a college education represent the one exception; they were not significantly affected. What is more, the impacts were not equally felt across countries. Different countries experienced the Great Recession to greater or lesser degrees depending on their labor market policies.

We find, individuals in countries with more generous unemployment support policies experienced the negative effects of the Great Recession to a lesser degree, generally confirming previous results in the literature (Carr and Chung 2014; Wulfgramm 2014). However, not all groups benefited from unemployment support. Youth (ages 15-24) experienced large and significant declines in subjective well-being during the Great Recession but did not benefit from unemployment support policies. In stark contrast, employment protection legislation exacerbated the negative effects of the Great Recession for most population groups. This finding is important. Employment protection is intended to protect employees, but during the Great Recession, any benefits for those who kept their jobs were outweighed by negative effects. We present suggestive evidence indicating unemployment increased during the recession as a result of stricter legislation governing the use of temporary contracts (EPL-T). Employment protection legislation that limits employee dismissals (EPL) operated through different mechanisms. Suggestive evidence indicates stricter EPL exacerbated the negative effects of the Great Recession by negatively affecting individuals' perceptions about their future job situation.

We assessed the role of two groups of unemployment support policies: (1) the proportion of income that is replaced when an individual becomes unemployed (net replacement rate or NRR) and (2) programs to assist unemployed people to find new jobs (active labor market policies or ALMP). The findings indicate NRR has a more robust and larger mitigating effect than ALMP, which is relevant for the current debate in Europe on labor market policy. In recent decades there has been a shift from NRR unemployment support toward ALMP programs. However, the evidence presented here suggests this shift is in error, at least in terms of protecting individuals from the effects of recessions on subjective well-being. Our findings are consistent with the findings of Wulfgramm (Wulfgramm 2014), who comes to the same conclusion regarding NRR and ALMP. However, both this study and the study by Wulfgramm focus on short-term effects,

meaning the findings may not apply in the long term. It is possible that ALMP policies have stronger long run outcomes.

If policy makers are interested in shielding their constituents from the harmful effects of recessions, then according to our results, they should implement generous unemployment benefits and lax employment protection legislation. In fact, they may consider flexicurity. Flexicurity is characterized by flexibility for firms to adjust their workforce and employment security. This may sound contradictory, yet employment security depends on both job security and the costs of unemployment. The costs of unemployment are reduced with more generous welfare and unemployment benefits (NRR) and reemployment opportunities, which are improved through greater ALMP and flexibility (reduced EPL). Denmark is often used as the model for flexicurity. However, for youth, labor market policies did not statistically moderate the effects of the Great Recession. New policies specifically targeting youth should be considered.

Appendix

(insert Table 5 here)

Assessing instrument validity using overidentification tests

The overidentification tests are conducted based on the main analysis using additional instruments,²¹ which were generated using the Lewbel (2012) method. The Lewbel (2012) method uses heteroskedasticity in the data and higher order restrictions to generate instruments without introducing external data. While somewhat new, it has been used numerous times now: Lewbel (2012) documents papers as early as 2007, and more recently by (Arampatzi et al. 2018; Denny and Oppedisano 2013; Le Moglie et al. 2015; O'Connor and Graham 2019; Sarracino and Fumarco 2018).

Using the Lewbel (2012) method, we generate the instruments as follows: (1) run a regression of our endogenous variable, $group_g X trough_t X policy_j$, on the other covariates from equation 1 and store the residuals, (2) de-mean the covariates and multiply them by the stored residuals.²² For example, instrument $Z_{igt}^* = (Z_{igt} - \overline{Z_{gt}}) * \mu_{igt}$, where Z_{igt} is any subset of the covariates and μ_{igt} are the stored residuals. The method relies on two key conditions. First, heteroskedasticity, which can be tested using the standard Breusch-Pagan test. The second condition is untestable and relies on an assumption. Specifically, the residual from the first step above multiplied by the second stage residual of life satisfaction must be unrelated to the covariates used to generate instruments, formally: $cov(Z_{igt}, \varepsilon_{igt} * \mu_{igt}) = 0$.²³ For Z, we only use gender. Gender is chosen as the only additional variable because we only need one additional variable per endogenous variable to test the overidentification restrictions and gender is exogenously

²¹ We had to make two adjustments to the main analysis in order to run the Hansen J overidentification test. First, because the number of clusters (countries) is too small for the Hansen test, we clustered at the country-period level to double the number of clusters. However, the clustered standard errors were quite similar in both cases, providing some reassurance that the change does not affect the overidentification test. Second, we partialled out the country fixed effects (dummies) to reduce the number of variables.

²² We use the user written command `ivreg2h` (Baum and Schaffer 2012) to generate the instruments in STATA.

²³ For identification, the standard assumption $E(X\varepsilon) = E(X\mu) = 0$ is also maintained, with X representing all of the covariates other than the instrumented one.

determined.²⁴ We use gender instead of age because age is used as one of groups of interest. In this way, we generate three additional excluded instruments for each 2SLS regression, one for each endogenous variable (policy by group). For a further description of the approach, see Baum et al. (2013) and Lewbel (2012).

Table 6 presents the results using the Lewbel generated instruments. They read the same as in Tables 1 and 2, with the addition of the Hansen J p-value, which reports the overidentification test results. As noted in the main text, the overidentification tests support the validity of our instruments. We fail to reject that the instruments are valid across each column. What is more, the coefficient estimates are nearly identical to the main results, consistent with expectations. We expected the coefficients to be similar because in the main analysis our instrument, peak policy, *strongly* predicts trough policy. This strength means that adding additional instruments should not greatly affect the first and second stage results. Across Tables 1 and 2, the lowest F-stat was nearly 24, more than double the often-used cut off value of 10 for weak instruments.

(insert Table 6 here)

Ordinal treatment of life satisfaction

Life satisfaction is inherently ordinal, yet the main analysis treats it cardinally. More generally, there are a few papers which critique inference based on subjective well-being, stating limitations based on the way it is reported or assumptions necessary to operationalize it (e.g., Bond and Lang 2019; Schröder and Yitzhaki 2017). Relatively early work has addressed the ordinal versus cardinal treatment of subjective well-being. For instance, Ng (1997) argues subjective well-being should conceptually be treated as cardinal, and Ferrer-i-Carbonell and Frijters (2004) find little difference between estimates when using cardinal versus ordinal models. However, the debate continues today, recently with responses to Bond and Lang (2019) and Schröder and Yitzhaki (2017) such as Chen et al. (2019) and Kaiser and Vendrik (2019). Cardinal treatment is often preferred because ordinal treatment has some limitations, for instance individual fixed effects are not possible in standard ordered choice models and instrumental variable methods would require

²⁴ Indeed introducing additional excludable instruments would weaken any findings that suggest peak policy is excludable. Overidentification tests apply to the full set of excluded instruments, and peak policy forms a smaller proportion of the set with more excluded instruments.

using different models for each stage (linear and non-linear). To address these issues, practitioners sometimes use both methods.

As mentioned in Section 5.3, we use two additional analyses that treat life satisfaction ordinally, ordered probit and linear probability. For the ordered probit model, we do not use an instrumental variable approach because we prefer to maintain the same treatment, linear or non-linear, for each stage. To conduct the linear probability model, we compress life satisfaction into a binary outcome, coded: 1 if the respondent responds in the top two categories, very or fairly satisfied; and 0 if they respond not very or not at all satisfied. This variable has an intuitive description, the probability that someone is more satisfied than not.²⁵ Given both stages are linear, we use instrumental variables like the main analysis.

The results are presented in Table 7. For each policy variable there are two columns, one for each method. Two panels present the results separately by education and cohort. The estimates are consistent in significance and direction (magnitudes are not directly comparable) with the main results, with two exceptions. For ALMP, two estimates according to the linear probability model are inconsistent; the most important change is for those with at least college education. Indeed, the effect changed direction. While the ordered probit and the results by cohort using both models are consistent, this change should be considered when interpreting the impacts of ALMP. For EPL, the estimate for the high school group was statistically significant but is no longer when using the linear probability model. This change does not pose much of a limitation however. It may be due to lower variability in the binary measure of life satisfaction, and the other estimates are consistent with the main results.

(insert Table 7 here)

²⁵ See Sechel (2019) as another paper which addresses measurement issues in subjective well-being (e.g., Bond and Lang 2019). In this case, by compressing the scale to a binary outcome, 1 if above a conceptually defined determined threshold, 0 otherwise.

References

- Anderson, C. J., & Pontusson, J. (2007). Workers, worries and welfare states: Social protection and job insecurity in 15 OECD countries. *European Journal of Political Research*, 46(2), 211–235. doi:10.1111/j.1475-6765.2007.00692.x
- Arampatzi, E., Burger, M. J., Ianchovichina, E., Röhrich, T., & Veenhoven, R. (2018). Unhappy development: dissatisfaction with life on the eve of the Arab Spring. *Review of Income and Wealth*, 64(S1), S80–S113. doi:10.1111/roiw.12388
- Arampatzi, E., Burger, M. J., Stavropoulos, S., & van Oort, F. G. (2019). Subjective Well-Being and the 2008 Recession in European Regions: The Moderating Role of Quality of Governance Subjective Well-Being. *International Journal of Community Well-Being*, (April). doi:10.1007/s42413-019-00022-0
- Arampatzi, E., Burger, M. J., & Veenhoven, R. (2015). Financial distress and happiness of employees in times of economic crisis. *Applied Economics Letters*, 22(3), 173–179. doi:10.1080/13504851.2014.931916
- Avdagic, S. (2015). Does Deregulation Work? Reassessing the Unemployment Effects of Employment Protection. *British Journal of Industrial Relations*, 53(1), 6–26. doi:10.1111/bjir.12086
- Baum, C. F., Lewbel, A., Schaffer, M. E., & Talavera, O. (2013). *Instrumental variables estimation using heteroskedasticity-based instruments*. Stata Users Group. <https://econpapers.repec.org/RePEc:boc:dsug13:05>
- Baum, C. F., & Schaffer, M. E. (2012). IVREG2H: Stata module to perform instrumental variables estimation using heteroskedasticity-based instruments. Boston College Department of Economics.
- Bell, D. N. F., & Blanchflower, D. G. (2011). Young people and the great recession. *Oxford Review of Economic Policy*, 27(2), 241–267. doi:10.1093/oxrep/grr011
- Bertrand, M., Duflo, E., & Mullainathan, S. (2004). How Much Should We Trust Differences-in-Differences Estimates? *Quarterly Journal of Economics*, 119(1), 249–275. <http://www.jstor.org/stable/25098683>
- Bjørnskov, C. (2014). Do Economic Reforms Alleviate Subjective Well-Being Losses of Economic Crises? *Journal of Happiness Studies*, 15(1), 163–182. doi:10.1007/s10902-013-9442-y
- Boarini, R., Comola, M., de Keulenaer, F., Manchin, R., & Smith, C. (2013). Can Governments Boost People’s Sense of Well-Being? The Impact of Selected Labour Market and Health Policies on Life Satisfaction. *Social Indicators Research*, 114(1), 105–120. doi:10.1007/s11205-013-0386-8
- Böckerman, P., Ilmakunnas, P., & Johansson, E. (2011). Job security and employee well-being: Evidence from matched survey and register data. *Labour Economics*, 18(4), 547–554. doi:10.1016/j.labeco.2010.12.011
- Bond, T. N., & Lang, K. (2019). The sad truth about happiness scales. *Journal of Political Economy*, 127(4), 1629–1640. doi:10.1086/701679

- Botero, J. C., Djankov, S., Porta, R. L., Lopez-de-Silanes, F., & Shleifer, A. (2004). The Regulation of Labor. *Quarterly Journal of Economics*, 119(4), 1339–1382. doi:10.1162/0033553042476215
- Bustillo, R. M. de, & Pedraza, P. de. (2010). Determinants of job insecurity in five European countries. *European Journal of Industrial Relations*, 16(1), 5–20. doi:10.1177/0959680109355306
- Cameron, A. C., & Miller, D. L. (2015). A Practitioner's Guide to Cluster-Robust Inference. *Journal of Human Resources*, 50(2), 317–372. doi:10.3368/jhr.50.2.317
- Cantril, H. (1965). *The Pattern of Human Concerns*. New Brunswick NJ: Rutgers University Press.
- Carr, E., & Chung, H. (2014). Job insecurity and life satisfaction : The moderating influence of labour market policies across Europe. *Journal of European Social Policy*, 24(4), 383–399. doi:10.1177/0958928714538219
- Chen, L., Oparina, E., Powdthavee, N., & Srisuma, S. (2019). *Have Econometric Analyses of Happiness Data Been Futile? A Simple Truth about Happiness Scales* (No. 12152).
- Clark, A. E. (2018). Four decades of the economics of happiness: where next? *Review of Income and Wealth*, 64(2), 245–269. doi:10.1111/roiw.12369
- Clark, A. E., Diener, E., Georgellis, Y., & Lucas, R. E. (2008). Lags and Leads in Life Satisfaction : A Test of the Baseline Hypothesis. *Economic Journal*, 118(529), F222–F243.
- Clark, A. E., Georgellis, Y., & Sanfey, P. (2001). Scarring: The Psychological Impact of Past Unemployment. *Economica*, 68(270), 221–241. doi:10.1111/1468-0335.00243
- Clark, A. E., & Postel-Vinay, F. (2009). Job security and job protection. *Oxford Economic Papers*, 61, 207–239. doi:10.1093/oep/gpn017
- Davidson, R., & Mackinnon, J. G. (2010). Wild Bootstrap Tests for IV Regression. *Journal of Business & Economics Statistics*, 28(1), 128–144. doi:10.1198/jbes.2009.07221
- De Neve, J.-E., Ward, G., De Keulenaer, F., Van Landeghem, B., Kavetsos, G., & Norton, M. I. (2018). The asymmetric experience of positive and negative economic growth: global evidence using subjective well-being data. *Review of Economics and Statistics*. doi:10.1162/REST_a_00697
- de Pedraza, P., Tjidsens, K., & Visintin, S. (2018). The matching process before and after the crisis in the Netherlands. *International Journal of Manpower*, 39(8), 1010–1031. doi:10.1108/IJM-10-2018-0329
- Denny, K., & Oppedisano, V. (2013). The surprising effect of larger class sizes: Evidence using two identification strategies. *Labour Economics*, 23, 57–65.
- Di Tella, R., MacCulloch, R. J., & Oswald, A. J. (2003). The Macroeconomics of Happiness. *The Review of Economics and Statistics*, 85(4), 809–827. doi:10.1162/003465303772815745
- Dickerson, A., & Green, F. (2012). Fears and realisations of employment insecurity. *Labour Economics*, 19(2), 198–210. doi:10.1016/j.labeco.2011.10.001
- Easterlin, R. A. (2013). Happiness, growth, and public policy. *Economic Inquiry*, 51(1), 1–15. doi:10.1111/j.1465-7295.2012.00505.x

- European Commission. (2006). *Employment in Europe 2006. Employment in Europe 2006*. Luxembourg: European Communities. http://ec.europa.eu/employment_social/employment_analysis/eie/eie2006_summary_en.pdf
- European Commission. (2007). Eurobarometer 68.1: ZA4565 data file version 4.0.1. Cologne: TNS Opinion & Social, Brussels. doi:10.4232/1.10988
- European Commission. (2009). Eurobarometer 71.3: ZA4973 data file version 3.0.0. Cologne: TNS Opinion & Social, Brussels. doi:10.4232/1.11135
- Feldmann, H. (2009). The unemployment effects of labor regulation around the world. *Journal of Comparative Economics*, 37, 76–90. doi:10.1016/j.jce.2008.10.001
- Ferrer-i-Carbonell, A., & Frijters, P. (2004). How Important is Methodology for the Estimate of the Determinants of Happiness? *The Economic Journal*, 114(497), 641–659.
- Frijters, P., Clark, A. E., Krekel, C., & Layard, R. (2020). A happy choice: wellbeing as the goal of government. *Behavioural Public Policy*, 1–40. doi:10.1017/bpp.2019.39
- Fujita, S., & Ramey, G. (2009). The cyclicalities of the separation and job finding rates in France. *International Economic Review*, 50(2), 415–430. doi:10.1016/j.euroecorev.2015.01.013
- Gonza, G., & Burger, A. (2017). Subjective Well-Being During the 2008 Economic Crisis: Identification of Mediating and Moderating Factors. *Journal of Happiness Studies*, 18, 1763–1797. doi:10.1007/s10902-016-9797-y
- Graham, C., Laffan, K., & Pinto, S. (2018). Well-being in metrics and policy. *Science*, 362(6412), 287–288. doi:10.1126/science.aau5234
- Green, F. (2009). Subjective employment insecurity around the world. *Cambridge Journal of Regions, Economy and Society*, 2(3), 343–363. doi:10.1093/cjres/rsp003
- Green, F., Felstead, A., & Burchell, B. (2000). Job insecurity and the difficulty of regaining employment: An empirical study of unemployment expectations. *Oxford Bulletin of Economics and Statistics*, 62, 855–883. doi:10.1111/1468-0084.0620s1855
- Helliwell, J. F. (2019). *Measuring and using happiness to support public policies* (No. 26529).
- Helliwell, J. F., & Huang, H. (2014a). New measures of the costs of unemployment: evidence from the subjective well-being of 3.3 million americans. *Economic Inquiry*, n/a-n/a. doi:10.1111/ecin.12093
- Helliwell, J. F., & Huang, H. (2014b). New Measures of the Costs of Unemployment: Evidence from the Subjective Well-Being of 3.3 Million Americans. *Economic Inquiry*, 52(4), 1485–1502. doi:10.1111/ecin.12093
- Hessami, Z. (2010). The size and composition of government spending in Europe and its impact on well-being. *Kyklos*, 63(3), 346–382. doi:10.1111/j.1467-6435.2010.00478.x
- Kahneman, D., Krueger, A. B., Schkade, D., Schwarz, N., & Stone, A. A. (2004). Toward National Well-Being Accounts. *American Economic Review*, 94(2), 429–434.
- Kaiser, C., & Vendrik, M. C. M. (2019). *How threatening are transformations of reported happiness to subjective wellbeing research?*
- Karabchuk, T., & Soboleva, N. (2019). Temporary Employment, Informal Work and Subjective

- Well - Being Across Europe: Does Labor Legislation Matter? *Journal of Happiness Studies*. doi:10.1007/s10902-019-00152-4
- Kim, M.-H., & Do, Y. K. (2013). Effect of Husbands' Employment Status on Their Wives' Subjective Well-being in Korea. *Journal of Marriage and Family*, 75(April), 288–299. doi:10.1111/jomf.12004
- Le Moglie, M., Mencarini, L., & Rapallini, C. (2015). Is it just a matter of personality? On the role of subjective well-being in childbearing behavior. *Journal of Economic Behavior and Organization*, 117, 453–475. doi:10.1016/j.jebo.2015.07.006
- Lewbel, A. (2012). Using Heteroscedasticity to Identify and Estimate Mismeasured and Endogenous Regressor Models. *Journal of Business & Economics Statistics*, 30(1), 67–80. doi:10.1080/07350015.2012.643126
- Lucas, R. E. (1987). *Models of Business Cycles*. Oxford [Oxfordshire]; New York: B. Blackwell.
- Luechinger, S., Meier, S., & Stutzer, A. (2010). Why does unemployment hurt the employed?: Evidence from the life satisfaction gap between the public and the private sector. *Journal of Human Resources*, 45(4), 998–1045. doi:10.3368/jhr.45.4.998
- Madsen, P. K. (2002). The Danish Model of Flexicurity: a Paradise — with Some Snakes. In H. Sarfati & G. Bonoli (Eds.), *Labour Market and Social Protection Reforms in International Perspective* (pp. 243–265). London: Ashgate Publishing. doi:10.4324/9781315251004-14
- Montagnoli, A., & Moro, M. (2018). The Cost of Banking Crises: New Evidence from Life Satisfaction Data. *Kyklos*, 71(2), 279–309. doi:10.1111/kykl.12170
- Ng, Y.-K. (1997). A case for happiness, cardinalism, and interpersonal comparability. *Economic Journal*, 107, 1848–1858.
- O'Connor, K. J. (2017a). Who Suffered Most From the Great Recession? Happiness in the United States. *RSF: The Russell Sage Foundation Journal of the Social Sciences*. doi:10.7758/RSF.2017.3.3.04
- O'Connor, K. J. (2017b). Happiness and Welfare State Policy Around the World. *Review of Behavioral Economics*, 4(4), 397–420. doi:10.1561/105.00000071
- O'Connor, K. J., & Graham, C. (2019). Longer, More Optimistic, Lives: Historic Optimism and Life Expectancy in the United States. *Journal of Economic Behavior and Organization*, 168, 374–392. doi:10.1016/j.jebo.2019.10.018
- Ochsen, C., & Welsch, H. (2012). Who benefits from labor market institutions? Evidence from surveys of life satisfaction. *Journal of Economic Psychology*, 33, 112–124. doi:10.1016/j.joep.2011.08.007
- Ono, H., & Lee, K. S. (2013). Welfare States and the Redistribution of Happiness. *Social Forces*, 92(2), 789–814. doi:10.1093/sf/sot094
- Origo, F., & Pagani, L. (2009). Flexicurity and job satisfaction in Europe: The importance of perceived and actual job stability for well-being at work. *Labour Economics*, 16(5), 547–555. doi:10.1016/j.labeco.2009.02.003
- Pacek, A. C., & Radcliff, B. (2008). Welfare policy and subjective well-being across nations: An individual-level assessment. *Social Indicators Research*, 89(1), 179–191.

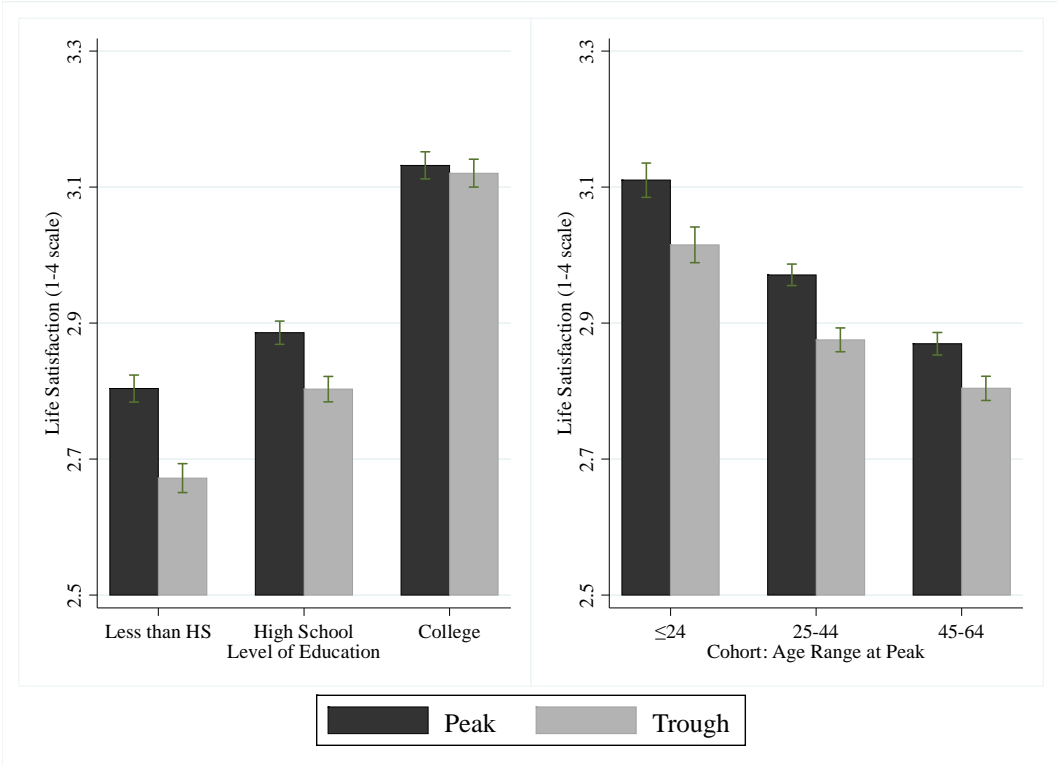
doi:10.1007/s11205-007-9232-1

- Pedraza, P. de, Álvarez-Díaz, M., & Domínguez-Torreiro, M. (2019). Sympathy for the Devil? Exploring Flexicurity Win–Win Promises. *IZA Journal of Labor Policy*, 9(1), 1–26. doi:10.2478/izajolp-2019-0009
- Romer, D. (1996). *Advanced Macroeconomics*. New York: McGraw Hill.
- Roodman, D., MacKinnon, J., Nielsen, M. Ø., & Webb, M. D. (2018). *Fast and Wild: Bootstrap Inference in Stata using boottest* (No. 1406). Kingston, Ontario, Canada.
- Rothstein, B. (2010). Happiness and the welfare state. *Social Research*, 77(2), 441–469. doi:10.2307/40972225
- Sage, D. (2015). Do Active Labour Market Policies Promote the Subjective Well-Being of the Unemployed? Evidence from the UK National Well-Being Programme. *Journal of Happiness Studies*, 16, 1281–1298. doi:10.1007/s10902-014-9549-9
- Sarracino, F., & Fumarco, L. (2018). Assessing the Non-financial Outcomes of Social Enterprises in Luxembourg. *Journal of Business Ethics*. doi:10.1007/s10551-018-4086-9
- Sarracino, F., & Piekalkiewicz, M. (2019). *The role of income and social capital for Europeans' well-being during the 2008 economic crisis*. Luxembourg.
- Scherer, S. (2009). The Social Consequences of Insecure Jobs. *Social Indicators Research*, 93, 527–547. doi:10.1007/s11205-008-9431-4
- Schröder, C., & Yitzhaki, S. (2017). Revisiting the evidence for cardinal treatment of ordinal variables. *European Economic Review*, 92(January), 337–358. doi:10.1016/j.euroecorev.2016.12.011
- Sechel, C. (2019). *Happier Than Them , but More of Them Are Happy: Aggregating Subjective Well-Being* (No. 2019008).
- Shimer, R. (2005). The cyclical behavior of equilibrium unemployment and vacancies. *American Economic Review*, 95(1), 25–49. doi:10.1016/j.euroecorev.2015.09.002
- Shimer, R. (2012). Reassessing the ins and outs of unemployment. *Review of Economic Dynamics*, 15(2), 127–148. doi:10.1016/j.red.2012.02.001
- Silla, I., Cuyper, N. de, Gracia, F. J., Peiró, J. M., & Witte, H. de. (2009). Job insecurity and well-being: Moderation by employability. *Journal of Happiness Studies*, 10(6), 739–751. doi:10.1007/s10902-008-9119-0
- The Global Happiness Council. (2018). *Global Happiness Policy Report 2018*. New York: Sustainable Development Solutions Network. happinesscouncil.org
- Uusitalo, R., & Verho, J. (2010). The effect of unemployment benefits on re-employment rates: Evidence from the Finnish unemployment insurance reform. *Labour Economics*, 17(4), 643–654. doi:10.1016/j.labeco.2010.02.002
- Veenhoven, R. (2000). Well-being in the welfare state: Level not higher, distribution not more equitable. *Journal of Comparative Policy Analysis: Research and Practice*, 2(1), 91–125. doi:10.1080/13876980008412637
- Vergeer, R., & Kleinknecht, A. (2012). Do Flexible Labor Markets Indeed Reduce

- Unemployment? A Robustness Check. *Review of Social Economy*, 70(4), 451–467. doi:10.1080/00346764.2012.681113
- Winkelmann, L., & Winkelmann, R. (1998). Why Are the Unemployed So Unhappy? Evidence from Panel Data. *Economica*, 65(257), 1–15. doi:10.1111/1468-0335.00111
- Wolfers, J. (2003). Is Business Cycle Volatility Costly? Evidence from Surveys of Subjective Well-Being. *International Finance*, 6(1), 1–26. doi:10.1111/1468-2362.00112
- Wulfgramm, M. (2014). Life satisfaction effects of unemployment in Europe: The moderating influence of labour market policy. *Journal of European Social Policy*, 24(3), 258–272. doi:10.1177/0958928714525817
- OECD 2014a. OECD StatExtracts. Quarterly Data. <http://stats.oecd.org>. Access date: May 2014.
- OECD 2014b. Directorate for Employment, Labour and Social Affairs, Benefits and Wages: Statistics. <http://www.oecd.org/els/benefitsandwagesstatistics.htm>. Access date: January 2013.
- OECD 2014c. Dataset: Public expenditure and participant stocks on LMP. Public expenditure as a percentage of GDP (Annual). <http://stats.oecd.org>. Access date: April 2013.
- OECD 2014d. OECD Indicators of Employment Protection. <http://www.oecd.org/employment/emp/oecdindicatorsofemploymentprotection.htm>. Access date: May 2014.

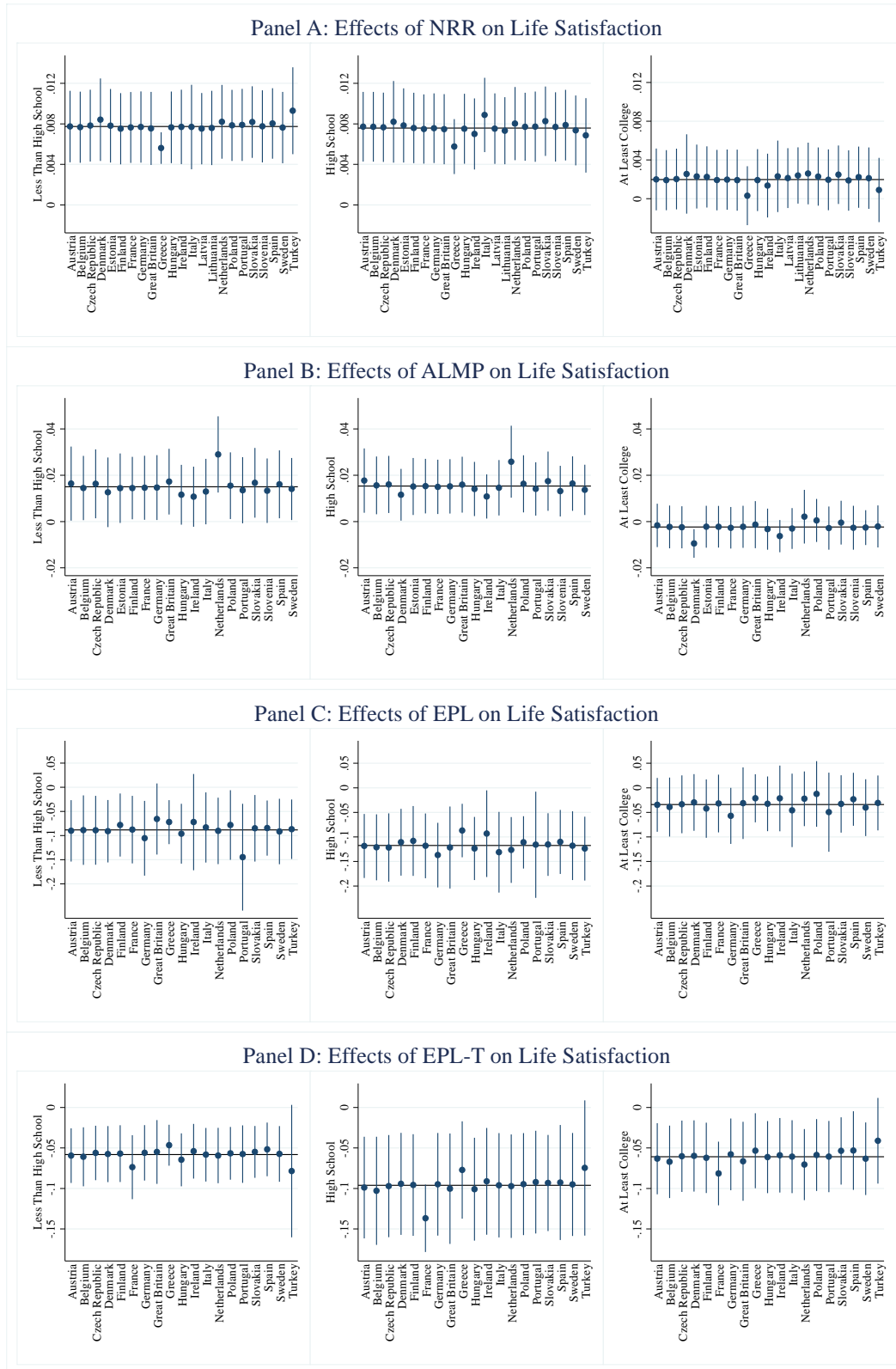
Figures and Tables

Fig. 1 Mean changes in life satisfaction from peak to trough of the Great Recession, by group



Notes: Mean life satisfaction of all 23 countries included in this analysis.

Fig. 2 Sensitivity of results to omission of individual countries, groups by level of education



Notes: Each point represents parameter estimates using the same methods used in Table 1, but omitting a single country for each point. Countries across the X axis are omitted. The horizontal lines represent the original parameter estimates from Table 1. 90% confidence intervals are included for each estimate.

Fig. 3 Sensitivity of results to omission of individual countries, groups by cohort



Notes: Each point represents parameter estimates using the same methods used in Table 2, but omitting a single country for each point. Countries across the X axis are omitted. The horizontal lines represent the original parameter estimates from Table 2. 90% confidence intervals are included for each estimate.

Table 1 Effects of policy variables on life satisfaction by level of education. Dependent variable: life satisfaction (1-4)

Policy Variable:	(1) NRR	(2) ALMP	(3) EPL	(4) EPL-T
Less than High School	0.008 [0.005]	0.015 [0.115]	-0.088 [0.028]	-0.058 [0.065]
High School	0.008 [0.003]	0.015 [0.078]	-0.118 [0.035]	-0.096 [0.083]
At Least College	0.002 [0.414]	-0.002 [0.732]	-0.034 [0.318]	-0.061 [0.080]
Mean Δ in Life Satisfaction				
Less than High School	-0.128	-0.084	-0.119	-0.119
High School	-0.079	-0.031	-0.057	-0.057
At Least College	-0.009	0.020	-0.000	-0.000
Beta Coefficients				
Less than High School	0.195	0.030	-0.121	-0.073
High School	0.197	0.034	-0.156	-0.095
At Least College	0.050	-0.007	-0.039	-0.053
Unemployment conts	yes	yes	no	no
Observations	33547	27792	28202	28202
Countries	23	19	19	19
R Sq.	0.251	0.248	0.232	0.234
Kleibergen-Paap F Stat.	265.760	23.437	137.235	30.235

2SLS regressions including controls for individual characteristics, macro variables, country fixed effects, and policy at trough instrumented with policy at peak. Policy units: NRR (0-100 scale); ALMP (1000s USD); EPL (0-6 scale); EPL-T (0-6 scale).

Bootstrap p-values in brackets

Table 2 Effects of policy variables on life satisfaction by cohort. Dependent variable: life satisfaction (1-4)

Policy Variable:	(1) NRR	(2) ALMP	(3) EPL	(4) EPL-T
Ages <= 24	0.003 [0.419]	-0.001 [0.910]	-0.041 [0.338]	-0.044 [0.361]
Ages 25 - 44	0.006 [0.053]	0.004 [0.561]	-0.083 [0.003]	-0.086 [0.038]
Ages 45 - 64	0.008 [0.000]	0.019 [0.073]	-0.130 [0.020]	-0.070 [0.063]
Mean Δ in Life Satisfaction				
Ages <= 24	-0.094	-0.051	-0.079	-0.079
Ages 25 - 44	-0.088	-0.044	-0.076	-0.076
Ages 45 - 64	-0.066	-0.024	-0.053	-0.053
Beta Coefficients				
Ages <= 24	0.058	-0.001	-0.044	-0.042
Ages 25 - 44	0.157	0.010	-0.118	-0.103
Ages 45 - 64	0.223	0.050	-0.172	-0.072
Unemployment conts	yes	yes	no	no
Observations	36879	30361	30781	30781
Countries	23	19	19	19
R Sq.	0.241	0.238	0.221	0.223
Kleibergen-Paap F Stat.	341.730	23.867	122.941	73.472

2SLS regressions including controls for individual characteristics, macro variables, country fixed effects, and policy at trough instrumented with policy at peak. Policy units: NRR (0-100 scale); ALMP (1000s USD); EPL (0-6 scale); EPL-T (0-6 scale)

Bootstrap p-values in brackets

Table 3 Effects of EPL and EPL-T on life satisfaction, with and without unemployment controls.
 Dependent variable: life satisfaction (1-4)

Policy Variable:	(1) EPL	(2) EPL	(3) EPL-T	(4) EPL-T	(5) EPL	(6) EPL	(7) EPL-T	(8) EPL-T
Less than High School	-0.088 [0.028]	-0.125 [0.005]	-0.058 [0.065]	-0.052 [0.135]				
High School	-0.118 [0.035]	-0.139 [0.018]	-0.096 [0.083]	-0.082 [0.175]				
At Least College	-0.034 [0.318]	-0.056 [0.120]	-0.061 [0.080]	-0.053 [0.105]				
Ages <= 24					-0.041 [0.338]	-0.071 [0.140]	-0.044 [0.361]	-0.032 [0.409]
Ages 25 - 44					-0.083 [0.003]	-0.113 [0.000]	-0.086 [0.038]	-0.078 [0.033]
Ages 45 - 64					-0.130 [0.020]	-0.151 [0.003]	-0.070 [0.063]	-0.064 [0.120]
Unemployment conts	no	yes	no	yes	no	yes	no	yes
Observations	28202	28202	28202	28202	30781	30781	30781	30781
Countries	19	19	19	19	19	19	19	19
R Sq.	0.232	0.249	0.234	0.249	0.221	0.239	0.223	0.240
Kleibergen-Paap F Stat.	137.235	133.732	30.235	28.540	122.941	117.525	73.472	61.621

2SLS regressions including controls for individual characteristics, macro variables, country fixed effects, and policy at trough instrumented with policy at peak. Policy units: EPL (0-6 scale); EPL-T (0-6 scale).

Bootstrap p-values in brackets

Table 4 Effects of EPL and EPL-T on perceptions of future job situation by level of education and cohort. Dependent variable: Job Situation Worse (Binary, Worse = 1)

Policy Variable:	(1) EPL	(2) EPL	(3) EPL-T	(4) EPL-T
Less than High School	0.015 [0.444]		0.018 [0.574]	
High School	-0.007 [0.584]		0.015 [0.679]	
At Least College	0.030 [0.053]		0.017 [0.353]	
Ages <= 24		-0.032 [0.145]		0.011 [0.837]
Ages 25 - 44		0.010 [0.456]		0.018 [0.589]
Ages 45 - 64		0.032 [0.030]		0.018 [0.343]
Observations	26400	28643	26400	28643
Countries	19	19	19	19
R Sq.	0.060	0.059	0.061	0.059
Kleibergen-Paap F Stat.	137.016	121.624	30.898	73.162

2SLS regressions including controls for individual characteristics, macro variables, country fixed effects, and policy at trough instrumented with policy at peak. No unemployment controls. Policy units: NRR (0-100 scale); ALMP (1000s USD); EPL (0-6 scale); EPL-T (0-6 scale)

Bootstrap p-values in brackets

Table 5 Peak and Trough Policy Variable Values, by Country

	<u>NRR (0-100 scale)</u>		<u>ALMP (1000s USD)</u>		<u>EPL (0-6 scale)</u>		<u>EPL-T (0-6 scale)</u>	
	Peak	Trough	Peak	Trough	Peak	Trough	Peak	Trough
Austria	54.89	54.59	5.54	5.86	2.62	2.62	1.31	1.31
Belgium	62.39	64.00	5.59	5.74	2.76	2.76	2.38	2.38
Czech Republic	50.29	50.18	1.27	1.01	2.79	2.79	1.13	1.13
Denmark	74.26	73.74	12.72	9.09	2.35	2.35	1.38	1.38
Estonia	38.13	39.84	0.25	0.28				
Finland	63.05	61.83	4.54	3.56	2.08	2.01	1.56	1.56
France	55.64	57.00	3.93	3.38	2.73	2.67	3.63	3.63
Germany	55.63	55.55	3.06	4.17	3.09	3.09	1.00	1.00
Great Britain	50.92	49.90	2.21	1.69	1.68	1.68	0.38	0.38
Greece	27.87	29.38			2.93	2.93	2.75	2.75
Hungary	45.55	46.62	0.82	0.79	2.40	2.40	1.13	1.13
Ireland	70.32	73.05	5.68	2.61	1.91	1.91	0.63	0.63
Italy	22.68	24.73	2.14	1.63	3.15	3.15	2.00	2.00
Latvia	42.89	47.50						
Lithuania	35.04	43.13						
Netherlands	68.49	68.13	12.98	12.84	2.92	2.87	0.94	0.94
Poland	45.09	42.71	0.89	1.26	2.41	2.41	1.75	1.75
Portugal	59.69	60.09	1.34	1.59	3.98	3.69	2.56	1.94
Slovakia	40.13	39.66	0.40	0.40	2.66	2.66	0.63	1.63
Slovenia	54.46	54.09	1.19	1.45				
Spain	50.63	49.79	2.70	1.29	2.76	2.76	3.00	3.00
Sweden	62.37	61.28	6.25	3.64	2.58	2.58	1.44	0.81
Turkey	21.42	22.98			2.54	2.54	4.88	4.88
Mean	50.08	50.86	3.87	3.28	2.65	2.62	1.81	1.80
Std Dev	14.51	13.84	3.71	3.23	0.50	0.46	1.15	1.12
Max	74.26	73.74	12.98	12.84	3.98	3.69	4.88	4.88
Min	21.42	22.98	0.25	0.28	1.68	1.68	0.38	0.38
Peak-Trough Corr.		0.99		0.94		0.99		0.96

Sources: OECD Directorate for Employment, Labour and Social Affairs, Benefits and Wages: Statistics. Available at: <http://www.oecd.org/els/benefitsandwagesstatistics.htm>

OECD Public expenditure and participant stocks on LMP. Public expenditure as a percentage of GDP (Annual). Available at: stats.oecd.org

OECD (2014d) OECD Indicators of Employment Protection. Available at: <http://www.oecd.org/employment/emp/oecdindicatorsofemploymentprotection.htm>

Table 6 Effects of policy variables on life satisfaction by level of education and cohort with additional Lewbel generated instruments. Dependent variable: life satisfaction (1-4)

Policy Variable:	(1) NRR	(2) ALMP	(3) EPL	(4) EPL-T	(5) NRR	(6) ALMP	(7) EPL	(8) EPL-T
Less than High School	0.008 [0.005]	0.015 [0.113]	-0.088 [0.028]	-0.058 [0.065]				
High School	0.008 [0.003]	0.015 [0.078]	-0.117 [0.035]	-0.097 [0.080]				
At Least College	0.002 [0.411]	-0.002 [0.727]	-0.034 [0.318]	-0.061 [0.080]				
Ages <= 24					0.003 [0.419]	-0.001 [0.917]	-0.041 [0.338]	-0.044 [0.358]
Ages 25 - 44					0.006 [0.053]	0.004 [0.564]	-0.083 [0.003]	-0.087 [0.038]
Ages 45 - 64					0.008 [0.000]	0.019 [0.073]	-0.130 [0.020]	-0.070 [0.068]
Unemployment conts	yes	yes	no	no	yes	yes	no	no
Observations	33547	27792	28202	28202	36879	30361	30781	30781
Countries	23	19	21	21	23	19	19	19
R Sq.	0.251	0.248	0.232	0.234	0.241	0.238	0.221	0.223
Kleibergen-Paap F Stat.	194395	29311	327990	34352	255329	255329	255329	255329
Hansen J p-value	0.114	0.316	0.642	0.550	0.376	0.576	0.349	0.264

2SLS regressions including controls for individual characteristics, macro variables, country fixed effects, and policy at trough instrumented with policy at peak and Lewbel generated instrument. Policy units: NRR (0-100 scale); ALMP (1000s USD); EPL (0-6 scale); EPL-T (0-6 scale)

Bootstrap p-values in brackets

Table 7 Ordinal treatment of life satisfaction, two sets of regressions, by education and cohort

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Model	O-Probit	LP	O-Probit	LP	O-Probit	LP	O-Probit	LP
Dep. Variable	Life-Sat.	Satisfied	Life-Sat.	Satisfied	Life-Sat.	Satisfied	Life-Sat.	Satisfied
Policy Variable	NRR		ALMP		EPL		EPL-T	
Estimates by education								
Less than High School	0.011	0.004	0.010	0.015	-0.146	-0.038	-0.082	-0.029
	[0.000]	[0.003]	[0.291]	[0.085]	[0.070]	[0.070]	[0.040]	[0.030]
High School	0.013	0.004	0.017	0.005	-0.199	-0.044	-0.149	-0.047
	[0.003]	[0.005]	[0.075]	[0.133]	[0.050]	[0.110]	[0.010]	[0.003]
At Least College	0.005	-0.001	-0.004	-0.005	-0.082	0.027	-0.092	-0.020
	[0.185]	[0.712]	[0.729]	[0.073]	[0.185]	[0.328]	[0.070]	[0.185]
Observations	33547	33547	27792	27792	28202	28202	28202	28202
R Sq.		0.186		0.174		0.166		0.167
Kleibergen-Paap F Stat.		265.760		23.437		137.235		30.235
Estimates by age								
Ages <= 24	0.006	0.000	0.000	-0.003	-0.099	-0.041	-0.065	-0.044
	[0.100]	[0.634]	[0.982]	[0.358]	[0.258]	[0.338]	[0.253]	[0.361]
Ages 25 - 44	0.009	0.002	0.001	0.001	-0.141	-0.083	-0.124	-0.086
	[0.023]	[0.075]	[0.947]	[0.614]	[0.053]	[0.003]	[0.005]	[0.038]
Ages 45 - 64	0.013	0.004	0.023	0.008	-0.200	-0.130	-0.104	-0.070
	[0.000]	[0.000]	[0.018]	[0.043]	[0.043]	[0.020]	[0.018]	[0.063]
Observations	36879	36879	30361	30361	30781	30781	30781	30781
R Sq.		0.178		0.166		0.221		0.223
Kleibergen-Paap F Stat.		341.730		23.867		122.941		73.472
Unemployment Controls	yes	yes	yes	yes	no	no	no	no
Countries	23	23	19	19	19	19	19	19

O-Probit: ordered probit. LP two-stage linear probability models, policy at trough instrumented with policy at peak. Regressions include controls for individual characteristics, macro variables, and country fixed effects. Policy units: NRR (0-100 scale); ALMP (1000s USD); EPL (0-6 scale); EPL-T (0-6 scale)

Bootstrap p-values in brackets