

Unemployment Insurance, Inequality of Opportunity, and Labor Market Conditions*

Jon Piqueras
Bocconi University

Abstract

This paper studies whether unemployment insurance should vary over the business cycle. I propose and empirically evaluate a framework to assess the welfare effects of extending benefit duration, accounting for selection into unemployment induced by changing work opportunities. Welfare effects depend on social preferences for redistribution across unemployed types, consumption-smoothing gains, and efficiency costs. Exploiting regional and time variation in Spain, where the unemployment rate tripled, I examine the evolution of these components. A newly-collected survey demonstrates stronger support for providing benefits to high-willingness-to-work unemployed, whose share increases in downturns. Consumption data reveal larger drops upon job loss when unemployment is high. Regression-discontinuity estimates using administrative records show efficiency costs fall in recessions. Taken together, results indicate that benefit duration should have been more generous at the Great Recession's peak than before. Moreover, they highlight that existing literature overlooking the large role of social benefits understates the optimal duration cyclicalities.

JEL Classification: D63, E21, J64, J65

Keywords: Unemployment Insurance, Social Preferences, Consumption Smoothing, Job Search

*Jon Piqueras: Bocconi University, Institute for Fiscal Studies, and Stone Centre at UCL (jon.piqueras@unibocconi.it). First version: February 2023. This version: July 2025. I am deeply grateful to Richard Blundell, Attila Lindner and Emmanuel Saez for their guidance and support throughout this project. I also thank Alan Auerbach, Aniko Biro, Anne Brockmeyer, Sydnee Caldwell, Pol Campos-Mercade, Nicolas Cerkez, Manasi Deshpande, Arindrajit Dube, Javier Feinmann, Esteban García-Miralles, François Gerard, Hilary Hoynes, Steffen Huck, Emiliano Huet-Vaughn, Aitor Irastorza-Fadrique, Xavier Jaravel, Patrick Kline, Camille Landais, Thomas Lazarowicz, Enrico Miglino, Julen Ortiz, Gonzalo Paz-Pardo, Ricardo Perez-Truglia, Sergi Quintana, Imran Rasul, Balazs Reizer, Arthur Seibold, Daphne Skandalis, Andrea Smurra, Jason Sockin, Johannes Spinnewijn, Dmitry Taubinsky, Guillermo Uriz-Uharte, Damián Vergara, Dajana Xhani, Danny Yagan, Gabriel Zucman and seminar participants at CERS, University College London, UC Berkeley, ENTER Jamboree 2023 at Mannheim, 24th IZA Summer School, EEA-ESEM 2023, EALE 2023, LABORE, and Stone Centre & UCL Research Day, ESCP Business School, University of Bonn, University of Leicester, University of Munich (LMU), Bank of Spain, University of Rochester, UC Santa Cruz, Universidad Carlos III de Madrid, Universitat Pompeu Fabra, Federal Reserve Bank of Boston, Northwestern University (SESP), Berlin School of Economics, University of Antwerp, Royal Holloway University of London and OECD for insightful comments. I am very thankful for the hospitality experienced during my visit to UC Berkeley/IRLE, where part of this paper was written. I gratefully acknowledge access to the unemployment spell data by the Spanish Social Security, and financial support from the European Union's Horizon 2020 research and innovation programme (grant number 949995), the Economic and Social Research Council under the ESRC Centre for the Microeconomic Analysis of Public Policy at the IFS, grant reference ES/T014334/1, Fundación Ramón Areces, and Stone Centre at UCL at different stages of the project. This paper was previously circulated under the title "Unemployment Insurance in Booms and Recessions". This paper was awarded the Young Labour Economist Prize 2023 by the European Association of Labour Economists.

1 Introduction

Unemployment insurance (UI) is a crucial tool for policymakers seeking to support individuals when hit by adverse employment shocks. Its importance is even higher during economic downturns, when large numbers of individuals unexpectedly lose their jobs and rely on this income support to alleviate the hardship of unemployment. Despite this being a widespread issue, there is significant variation across countries in how the generosity of the program varies with economic conditions. While some, like the United States, usually provide more generous transfers during recessions, others, like many countries in Western Europe, keep transfers constant regardless of economic conditions.

Economists have long debated about whether the unemployed should receive more generous transfers when economic conditions are bad. The debate centers around how the efficiency costs and social benefits associated with UI ([Baily, 1978](#); [Chetty, 2006](#)) evolve with economic conditions. Existing evidence on social benefits over the cycle, which focuses on the consumption insurance value, is scant and remains inconclusive, since empirical studies usually exploit relatively small variations in the unemployment rate which may limit the power to detect fluctuations of these components. More fundamentally, the canonical framework fails to capture the inherent distributional feature of the system, since benefit reforms that differentiate according to labor market conditions effectively transfer resources across groups of unemployed individuals that may differ drastically. These individuals may not only differ in their ability to smooth consumption, but also on the source of their unemployment status: while a labor supply narrative may be better suited for the unemployed in good times, involuntary unemployment due to lacking work opportunities becomes increasingly significant as labor market conditions deteriorate ([Summers, 2010](#)).¹ Consequently, accounting for shifts in the composition of the unemployed becomes crucial, possibly affecting the welfare implications of unemployment benefit reforms over the cycle.

This paper proposes, and empirically evaluates, a framework to assess the welfare consequences of changing UI generosity with economic conditions. The framework characterizes the welfare impact of benefit duration extensions depending on three components: preferences for redistribution between different types of unemployed, consumption smoothing gains, and efficiency costs. It extends previous work by accounting for differential selection of individuals

¹Intuitively, the role of these two components changes substantially over the cycle, as conveyed by Summers: “*In an economy that is as demand constrained as ours, whatever small changes in search intensity may be associated with unemployment insurance are not the reason for the persistence of joblessness. With five unemployed Americans seeking work for every job opening available, there can be little doubt that the overwhelming cause of unemployment is not a lack of will among the jobless to find work, but a lack of work opportunities*”.

into unemployment, incorporating inequality of opportunity in job attainment (Roemer, 1998) due to variation in labor market conditions. In the model, the social benefits of UI reforms do not only arise from alleviating consumption inequality due to unemployment. The origin of this inequality also matters, becoming key to disentangle whether unemployment emerges from unequal economic opportunities (e.g., job offers) or disparities in individual effort (e.g., job search).

The framework delivers a set of high-level “sufficient statistics” that can be estimated empirically, providing a direct link between theory and evidence. I implement this framework in the context of Spain, which is particularly well-suited for this analysis since it features unusually large variation in the unemployment rate. Over the period of study, 2005-2017, the national unemployment rate increased from 7.9% to 26.9%, making this context remarkable relative to international standards (see Figure A1). The empirical analysis combines administrative data on unemployment spells, survey data on consumption, time use survey data on job search, and a representative online survey I conducted on preferences for redistribution. Along with policy variation and the aforementioned variation in economic conditions, it enables a comprehensive assessment of all the inputs needed to evaluate the welfare effects of differentiating UI duration across good and bad times.

The theoretical framework follows Baily (1978), Lentz and Tranaes (2005), Chetty (2008), Schmieder et al. (2012), and Kolsrud et al. (2018), where a population of heterogeneous unemployed individuals look for jobs by making search effort and savings decisions. Individuals are also subject to different economic conditions (good or bad), where search effort is more or less effective in terms of job finding (unequal economic opportunity). The government provides unemployed individuals with unemployment benefits that are paid over a limited number of periods, and this duration can be made dependent on economic conditions.

I extend the standard framework by allowing the unemployed to differ in their willingness to work: the extent to which they search for jobs conditional on the economic environment. The government maximizes the welfare-weighted utility of employed and unemployed individuals. In the spirit of the generalized social marginal welfare weights of Saez and Stantcheva (2016), the welfare weights can depend on the unemployed’s willingness-to-work type. In this setting, the social benefits of UI reforms are allowed to reflect social preferences that depend on whether inequality emerges because of bad luck (not finding a job when labor demand is dampened) or lack of effort (not finding a job when plenty of opportunities are available). Focusing on this effort dimension is natural for several reasons. First, effort is the main choice variable determining unemployment duration in canonical job search models which are employed in the UI literature. Second, it is consistent with an influential body of work showing that effort constitutes a central

driver of demand for redistribution across a broad range of settings (Alesina and Angeletos, 2005; Almås et al., 2010; Cappelen et al., 2007; 2013; Durante et al., 2014; Alesina et al., 2018; Almås et al., 2020). Third, given that the importance of effort as a determinant of unemployment varies greatly over the cycle (Summers, 2010), and thus large shifts in the pool of unemployed can potentially take place, it becomes particularly relevant to account for this dimension when assessing the welfare effects of UI reforms that transfer resources across individuals in different labor market conditions.

The optimal cycle-dependent benefit duration follows a Baily-Chetty intuition in this economy: social benefits and costs of unemployment insurance in good times must balance the benefits and costs in bad times. This condition provides a transparent link between theory and evidence that is robust to a wide range of specific assumptions about the underlying model. The benefits and costs of UI benefit extensions are fully captured by three sufficient statistics that can be estimated in the data. First, the framework introduces a novel channel determining the social benefits provided by UI transfers over the cycle. In the presence of preferences for redistribution across the unemployed based on their willingness to work, the social benefits of UI reforms take into account that the composition of the unemployed may differ in booms and recessions. Although individual willingness to work is not directly observed, aggregate economic conditions seen through the lens of this framework reveal information about the type of the average unemployed. In good times, when job opportunities are available, individuals with a high willingness to work often find a job, and so the pool of unemployed is on average composed of low-willingness-to-work individuals. However, in bad times, even individuals with high willingness to work are likely to remain unemployed, and thus the pool of unemployed is composed of both low-but also high-willingness-to-work types. This implies that, all else constant, the willingness to work of the average unemployed increases with the unemployment rate.² Therefore, in the presence of asymmetric information, a social planner who prefers to provide income support for individuals whose unemployment status is not caused by limited job search effort can use aggregate conditions to target resources towards them. As a result, the larger the gap in society's relative valuations between the unemployed in recession and the unemployed in boom, the larger the welfare effects of having higher potential UI duration in recession relative to boom.

Second, benefit duration depends on the consumption smoothing gains provided by the transfers. This component captures differences in the marginal utility of consumption of a euro

²In other words, aggregate unemployment rate can be seen as a shifter of the signal-to-noise ratio in the spirit of Alesina and Angeletos (2005), where the signal here corresponds to the voluntary part of unemployment and the noise to the involuntary one. The ratio in this context is decreasing with the unemployment rate, so that the moment of the cycle provides additional information to the government about the role of lack of effort vs bad luck in individuals' employment status.

of unemployment benefits across unemployed individuals in different economic conditions. On the one hand, it captures the standard insurance value, where the transfers are more valuable when individuals are less able to self-insure themselves against job loss. On the other hand, it also captures the fact that the system does not only provide insurance, but also potentially redistributes by effectively transferring resources across groups of individuals, who may differ in their pre-unemployment consumption levels. Consequently, the larger the gap in marginal utilities of consumption between the unemployed in recessions and the unemployed in booms, the larger the welfare impact of UI reforms that differentiate benefit duration between these two economic conditions.

Third, the derived formula highlights that the welfare effects of duration extensions also depend on the evolution of the efficiency costs of the policy over the cycle. Higher potential benefit duration (PBD) reduces incentives to look for jobs, which may result in distortions of labor supply with individuals spending more time unemployed and thus taking longer to find a job. This imposes an additional cost on the government budget, since the longer unemployment duration translates into more resources spent on unemployment benefits and less resources collected through taxes when employed. In this context, a larger gap between the labor supply distortion caused by extending benefit duration in good times relative to bad times corresponds to a larger welfare effect of cycle-dependent reforms.

The framework described above guides the empirical analysis, which is structured in three parts. The first part quantifies how the component capturing the social benefits of the transfers — due to both preferences for redistribution and changes in the unemployed's composition — evolves with economic conditions. I proxy willingness to work by the search effort level that the unemployed exert in boom periods. Individuals who search on a weekly basis are considered to have a high willingness to work, while those who do not are characterized by low willingness. I assess whether society has a preference for redistribution between these types of unemployed individuals. To do so, I explicitly design a survey and administer it to a sample of 1022 individuals who are representative of the Spanish active population. The survey design contains features such as order randomization and open-ended questions to make sure that results are not driven by order effects or specific characteristics of the implementation. In a first step towards eliciting preferences, respondents are asked to express preference towards resource allocation between two types of unemployed: one who searched for jobs last week and one who did not. Remarkably, around 75% conveys a desire to reward job search behavior. The remaining share of respondents does not consider effort to be a dimension that should drive unequal allocations. In a second step, with the aim of quantifying relative valuations between types, respondents are presented with multiple pairwise choices that differ in the amounts received by each type of unemployed.

The design varies experimentally the cost of the transfer between individuals, allowing me to elicit the distribution of relative valuations by society between the two types. This approach yields estimates that imply strong preferences for redistribution, with society valuing a transfer to the low-willingness-to-work type at only 8% of the value placed on an equivalent transfer to the high-willingness-to-work type.

After documenting significant preferences for redistribution along the willingness-to-work dimension, I study changes in the composition of the unemployed over the cycle. By exploiting the Spanish Time Use data, I show that the share of unemployed who search for jobs weekly increases strongly with the unemployment rate. Nevertheless, this increase could reflect both a change in composition of the unemployed and a behavioral change. I follow [Mukoyama et al. \(2018\)](#) to gauge the part driven by composition, and find that there is a large change over the business cycle driven just by the shift in composition: the share of weekly searchers (high willingness to work) goes from 49% in boom to 68% in recession. I provide a sensitivity analysis including a prediction exercise just using the Spanish data, where I first estimate the relationship between effort and a set of demographics, and then study how predicted effort varies given the observed change in demographics of the unemployed over the cycle. The results confirm the main finding of a considerable shift in the pool of unemployed towards high-willingness-to-work types in bad times. Combining the change in the composition of types over the cycle with the relative valuations between types, I estimate a ratio of welfare weights of 1.31. That is, society values a €1 transfer to the type of individuals unemployed in recession as much as €1.31 to those unemployed during a boom.

The second part of the analysis explores how the component of social benefits due to consumption smoothing gains of the transfers varies with economic conditions. In doing so, I employ a difference-in-differences design similar to [Gruber \(1997\)](#) where I compare the consumption patterns of individuals becoming unemployed with those of individuals who remain working. I exploit rich survey panel data on household consumption, which provide detailed information on different consumption categories. This allows me to study the effect on both food consumption — that has traditionally been the focus of the literature due to data limitations — and on overall consumption including housing, utilities, clothing and transportation among others. On the one hand, assessing self-insurance ability, I find that on average, households experience an overall 9.6% (s.e. 1.3%) reduction in consumption upon job loss. Moreover, this drop increases in bad times, with a 1 p.p. increase in unemployment rate resulting in an additional 0.4% (s.e. 0.1) reduction relative to pre-unemployment consumption levels. Similarly to [Kroft and Notowidigdo \(2016\)](#), I find no significant variation in the drop in food consumption over the business cycle. The main categories that drive the consumption drop fluctuations are

housing and utilities, and clothing.

On the other hand, I investigate whether in addition to consumption drops upon unemployment, the consumption levels of the unemployed also differ because of disparities in pre-layoff consumption. I find that individuals getting unemployed already had lower consumption prior to job loss relative to those who remained employed. However, this gap does not vary with economic conditions. This implies that, although the UI system redistributes between people of different pre-layoff consumption levels, it does not do so differentially across booms and recessions and so this component does not have empirical relevance for assessing the cyclicality of the policy. As a result, overall, extending UI duration in recessions provides larger consumption smoothing gains relative to extensions in boom periods, arising from its insurance role. Moreover, it underscores the importance of leveraging detailed consumption data and helps reconcile previous work documenting a constant drop in consumption over the cycle.

The third part employs administrative data on unemployment spells to analyze the evolution of the efficiency cost over the cycle. This cost depends on two components. First, a mechanical one, captured by the share of people who remain unemployed after benefit exhaustion, which I estimate nonparametrically. Second, a behavioral one, captured by the response of unemployment duration to changes in potential benefit duration, which I estimate through a regression discontinuity design. To estimate the latter, I leverage variation in the structure of the Spanish UI system, where the statutory duration of the benefits varies discretely at several work experience thresholds. I find that, on average, for every €1 transferred mechanically to the unemployed, the government needs to levy €0.87 on top of that because of the behavioral response. Consistent with results by [Schmieder et al. \(2012\)](#), I also find that the efficiency cost declines in recessions, and that this is driven by a higher share of individuals exhausting benefits in recessions as opposed to a larger marginal effect of potential benefit duration on unemployment duration.

Finally, the empirical findings are used to inform the statistics of interest in the derived framework, with the aim of assessing the welfare effects of a hypothetical reform making UI benefit duration dependent on the business cycle. Specifically, I estimate that a local budget-balanced reform of the UI system that increases the duration of benefits for the unemployed in recession, and reduces the duration for the unemployed in boom, would yield a net welfare gain of €0.78 per euro transferred from individuals unemployed in boom to individuals unemployed in recession. Around 80% of this welfare gain comes from an increase of the social benefits provided by UI transfers, with an approximately equal contribution of the consumption smoothing and the novel preferences for redistribution components. The remaining 20% is due to the lower efficiency cost of increasing generosity in bad times.

The large welfare effects imply that the potential duration of benefits should increase with

the unemployment rate. Importantly, these findings highlight the quantitative relevance of the change in social benefits over the cycle that has been overlooked in related empirical literature, which mostly focuses on the change in efficiency costs. In contrast, the total welfare gains of extending UI in recessions estimated in this paper are five times as large relative to the gains considering only the efficiency cost. This implies that UI benefit duration should increase more with the unemployment rate than predicted by previous work.³ Note that this finding is not driven by the specific welfare criterion emphasized here. Even abstracting from welfare weights and considering only the changes in consumption smoothing benefits over the cycle, which would correspond to the standard utilitarian framework, I estimate that the welfare gains are approximately three times the gains that include only the efficiency cost.

My work relates to several strands of the literature. It first relates to a strand that employs a sufficient-statistics approach to characterize the welfare effects of UI reforms, building on seminal work by [Baily \(1978\)](#), [Gruber \(1997\)](#) and [Chetty \(2006\)](#).⁴ Within this tradition, it adds to work focusing on changes of generosity over the business cycle, where one strand applies the Baily-Chetty insights ([Schmieder et al., 2012](#); [Kroft and Notowidigdo, 2016](#); [Landais et al., 2018a;b](#)), while another one relies on model-based calibrations ([Mitman and Rabinovich, 2015](#); [McKay and Reis, 2021](#); [Kekre, 2023](#)). Relative to most prior work following a stylized characterization, the proposed framework first recognizes that benefit duration extensions over the cycle effectively transfer resources across groups of heterogeneous unemployed individuals. This parallels recent studies considering the distributional features of pension reforms ([Kolsrud et al., 2024](#)), and UI reforms in a static environment ([Ferey, 2022](#)). Taking this feature into consideration, it explores the welfare consequences of UI policy differentiation by incorporating social preferences for redistribution along the main choice variable in canonical job search models and a well-documented driver of society's fairness views and demand for redistribution (e.g., [Cappelen et al., 2007; 2013](#); [Durante et al., 2014](#); [Almås et al., 2020](#)). Considering this dimension — with potentially large variation with economic conditions — is not only relevant to understand society's actual tradeoffs and properly account for them when assessing welfare effects, but also to inform the set of socially acceptable reforms that policymakers can implement.

In doing so, it draws on a separate line of work regarding equality of opportunity (e.g.,

³For example, based on the survival rates presented in [Kroft and Notowidigdo \(2016\)](#), back-of-the-envelope calculations assuming a constant marginal response over the cycle suggest that, under the standard framework and considering only the efficiency cost, it is very difficult to rationalize extending benefits from 26 to 99 weeks as implemented in the US. This is a motivation for further understanding of the changes of social benefits, focusing both on the consumption smoothing benefits and incorporating empirically-relevant social preferences.

⁴Later work enriches the sufficient statistics approach considering other dimensions of the generosity of unemployment benefits (e.g., [Card et al., 2007](#); [Shimer and Werning, 2008](#); [Kolsrud et al., 2018](#); [Lindner and Reizer, 2019](#); [Campos et al., 2022](#); [Ferey, 2022](#); [Wunsch and Zabrodina, 2024](#)). For a recent review, see [Le Barbanchon et al. \(2024\)](#).

Roemer, 1998; Roemer et al., 2003; Alesina and Angeletos, 2005; Alesina and La Ferrara, 2005; Alesina et al., 2018), and focuses on this aspect in the context of unemployment policy. Evaluating the social benefits of this type of UI reforms boils down to quantifying what is the value of a one euro transfer between the average unemployed in boom and in recession. For the empirical application integrating these insights, it builds on the generalized social marginal welfare weights approach proposed by Saez and Stantcheva (2016), and is related to contemporaneous work by Capozza and Srinivasan (2024) in the context of US income taxation. I contribute by designing and administering a new survey which is explicitly constructed to estimate preferences for redistribution between types of unemployed individuals that differ in their willingness to work. By empirically incorporating the social preference for reducing the degree of inequality induced by luck, while rewarding individual effort, the framework evaluates reforms to the benefit system, capturing both the standard consumption smoothing motive and accounting for disparities in economic opportunity.⁵

The second part of the empirical analysis relates to work on the social benefits of UI transfers.⁶ Specifically, the literature has focused on its consumption insurance value, starting with the seminal work on consumption behavior by Gruber (1997) and followed by Browning and Crossley (2001); Stephens Jr (2001); Hendren (2017); Kolsrud et al. (2018); Campos and Reggio (2019); Ganong and Noel (2019); Gerard and Naritomi (2021); Landais and Spinnewijn (2021).⁷ However, evidence on how the value of UI changes with economic conditions is surprisingly scant. A few recent studies document consumption patterns over the period of the Covid pandemic (Chetty et al., 2020; Ganong et al., 2022), while, to the best of my knowledge, only one paper considers changes over the business cycle (Kroft and Notowidigdo, 2016). This study finds that the insurance value does not vary with economic conditions. Unfortunately, given the institutional setting and the available data, their results only consider food consumption, and the variation in unemployment rate effectively exploited is relatively small, raising concerns about potential lack of power to detect fluctuations.⁸ I revisit this aspect by providing evidence from a

⁵It is also related to the work on “tagging” (Akerlof, 1978), where here economic conditions reveal additional information about the average unemployed’s willingness-to-work type and are used as an imperfect tag.

⁶The evidence on the value of transfers has historically lagged behind the evidence on disincentive effects. This historical emphasis in the literature on the costs of government programs, as opposed to their benefits, is not only present in Unemployment Insurance, but extends to other programs including Medicaid, AFDC/TANF and SNAP in the US as documented by Aizer et al. (2022).

⁷More generally, it also relates to studies on consumption responses to income shocks (e.g., Blundell et al., 2008; Low and Pistaferri, 2015; Autor et al., 2019; Gross et al., 2020; Ganong et al., 2020).

⁸The smaller variation in unemployment rate relative to my setting arises from two factors. First, overall fluctuations in the US Great Recession are an order of magnitude smaller than in the case of Spain. Second, benefit generosity in the US tends to increase when the unemployment rate increases. Given that the interest is on understanding consumption insurance over the cycle, while keeping generosity *constant*, the relation between benefits and unemployment needs to be controlled for and so the effective variation used is smaller. The potential duration of benefits in Spain is constant over the cycle, which allows to exploit relatively more variation.

setting where rich consumption data beyond food consumption is available, together with large variation in unemployment rate. I find that the insurance value changes over the cycle, and that the result is driven by non-food consumption categories, thus being able to reconcile previous findings in the literature.

Finally, this paper also relates to studies analyzing labor supply disincentive effects induced by increases in unemployment benefit generosity. While a sizable literature quantifies labor supply distortions at a given moment of the cycle (e.g., [Katz and Meyer, 1990](#); [Card and Levine, 2000](#); [Krueger and Meyer, 2002](#); [Rothstein, 2011](#); [Landais, 2015](#); [Lalive et al., 2015](#); [Le Barbanchon, 2016](#); [Chodorow-Reich et al., 2019](#); [Hagedorn et al., 2019](#); [Dieterle et al., 2020](#); [Boone et al., 2021](#); [Gerard and Gonzaga, 2021](#); [Khoury, 2021](#); [Lichter and Schiprowski, 2021](#); [Marinescu et al., 2021](#); [Domenech-Arumi and Vannutelli, 2023](#); [Acosta et al., 2023](#); [Hernandez Martinez and Liu, 2025](#)), few studies analyze how the disincentive effects evolve over the cycle ([Schmieder et al., 2012](#); [Farber et al., 2015](#); [Kroft and Notowidigdo, 2016](#)). My paper provides new insights on the evolution of labor supply responses induced by potential benefit duration extensions at different points of the cycle, in a setting with remarkably large variation in economic conditions.

The rest of the paper proceeds as follows. Section 2 provides the theoretical framework used to evaluate the marginal welfare gains from benefit duration extensions. Section 3 describes the institutional context and the data. Section 4 presents the empirical methodology and the results. Section 5 describes the welfare implications, and Section 6 concludes.

2 Framework

2.1 Setup

Here I present a stylized version of the main framework, which will guide the empirical analysis. It builds on [Baily \(1978\)](#), [Lentz and Tranaes \(2005\)](#), [Chetty \(2008\)](#), [Schmieder et al. \(2012\)](#), and [Kolsrud et al. \(2018\)](#), and characterizes the job search problem of the unemployed and the policy choice of the social planner in good and bad times. I study changes in benefit duration over the cycle, while keeping taxes fixed. This allows me to focus on the unemployed, considering transfers between individuals unemployed at different moments of the business cycle, and accounting for composition shifts in the pool of unemployed. A more detailed derivation is provided in Appendix B.1.

Environment. There is a continuum of agents with unit mass. They become unemployed at $t = 0$, where time corresponds to periods of the individual's spell measured since the event of job loss. In each period, they can be employed or unemployed until the last period of the

spell T when they retire. Employment status is $s \in \{e, u\}$, which refers to employment and unemployment, respectively. They make saving decisions $a_{i,t}$ and, while unemployed, they also choose search effort $e_{i,t}$ facing a fixed wage that is high enough to ensure that all job offers will be accepted. Effort increases the probability of finding a job next period, $h^k(e_{i,t})$, in a way that potentially differs depending on the moment of the business cycle k . Search is costly as given by $\psi_i(e_{i,t})$, which is assumed to be differentiable, increasing and convex. There are two aggregate economic conditions $k \in \{B, R\}$, boom and recession, with the only difference being a different mapping between search effort and job finding such that $h^B(e_{i,t}) > h^R(e_{i,t})$ (i.e. for a given effort level, job finding is higher in boom than in recession).⁹ Formally, the problem of an unemployed individual with assets a_i in economic condition k at time t is:

$$V_{i,t}^u(a_{i,t}, k_t) = \max_{e_{i,t}, a_{i,t+1}} u(c_{i,t}^u) - \psi_i(e_{i,t}) + \beta E_t[(1 - h^k(e_{i,t})) V_{i,t+1}^u(a_{i,t+1}, k_{t+1}) + h^k(e_{i,t}) V_{i,t+1}^e(a_{i,t+1}, k_{t+1})] \quad (1)$$

where $a_{i,t+1} = (1 + r)a_{i,t} + b_t^k + y_u - c_{i,t}^u$ and $a_{i,t+1} \geq \bar{a}_i$. When re-employed, the agent solves the following problem:

$$V_{i,t}^e(a_{i,t}, k_t) = \max_{a_{i,t+1}} v(c_{i,t}^e) + \beta E_t V_{i,t+1}^e(a_{i,t+1}, k_{t+1}) \quad (2)$$

where $a_{i,t+1} = (1 + r)a_{i,t} + w_i - \tau - c_{i,t}^e$ and $a_{i,t+1} \geq \bar{a}_i$. Flow utilities for the unemployed and employed are $u(c_{i,t}^u) - \psi_i(e_{i,t})$ and $v(c_{i,t}^e)$, with $u(\cdot)$ and $v(\cdot)$ being increasing and concave. Unemployed's consumption is denoted by $c_{i,t}^u$, and employed's consumption by $c_{i,t}^e$. Each individual receives a wage w_i and pays a tax τ when employed, and receives benefits b_t^k (which may depend on economic conditions) and non-labor income y_u when unemployed. Savings cannot be lower than a borrowing constraint \bar{a}_i .

Government policy. I consider an unemployment benefit policy P characterized by a benefit profile $\{b_t^k\}_{t=1}^T$ for $k \in \{B, R\}$. The government commits to a given benefit policy before the start of the model. The starting point is an environment with a fixed benefit level and with fixed potential benefit duration $P^k = P$ which does not depend on the cycle, such that agents receive benefit $b_t^k = b$ from $t = 1$ to $t = P$, and $b_t^k = 0$ afterwards. The choice of benefit generosity by the planner is the benefit duration P^k , considering a local reform where the duration can be made dependent on the moment of the cycle k . For simplicity, the policy characterization ignores time discounting ($1 + r = \beta = 1$). The government's budget is given by:

$$G(P) = (T - \alpha^B D^B - \alpha^R D^R)\tau - \alpha^B \sum_{t=1}^T S_t^B b_t^B - \alpha^R \sum_{t=1}^T S_t^R b_t^R \quad (3)$$

⁹Thus, in each period, agents can be in four mutually exclusive labor market statuses, which result from the combination of employment/unemployment and boom/recession. The stylized version of the model considers two aggregate economic conditions for simplicity, but can be easily extended to consider a continuum of them.

where $D^k = \sum_{t=1}^T S_t^k$ refers to total nonemployment duration in aggregate economic conditions k , S_t^k refers to the survival rate at time t and economic conditions k , and $\alpha^k = \int \frac{1}{T} \sum_{t=1}^T \mathbb{1}[k(i, t) = k] di$ refers to the share of time that individuals spend living in economic conditions k before retirement. The budget aggregates income taxes and benefit spending over time and across economic conditions. Social welfare for a given unemployment benefit policy is:

$$W(P) = \int \omega(\bar{e}_i) V_{i,0}(P) di + \lambda[G(P) - \bar{G}] \quad (4)$$

where $V_{i,0}(P)$ refers to indirect lifetime utility, and the social planner places welfare weights $\omega(\bar{e}_i)$, which depend on the willingness-to-work type, capturing specific preferences for redistribution towards individuals with specific attitudes towards job search \bar{e}_i (Saez and Stantcheva, 2016). Specifically, individuals are characterized by a willingness-to-work type defined as the average effort level exerted when faced with fixed benefit policy and economic conditions. Without loss of generality, the type is defined by fixing economic conditions as those corresponding to boom period, such that $\bar{e}_i = E_t[e_{i,t}|k = B, P]$. Accordingly, this characterization thus assigns a type for each individual regardless of her actual aggregate economic condition, evaluating individual effort when everyone faces the same economic circumstances. Moreover, note that the welfare weights are defined based on a fixed type, and so they do not respond to changes in the benefit policy since the type depends on an exogenous benefit policy. The Lagrange multiplier on the budget's constraint is denoted by λ , and \bar{G} is an exogenous revenue constraint.

Reform of benefit generosity. The planner considers increasing the duration of benefits for the unemployed in recession and reducing the duration of benefits for the unemployed in boom $\left(\frac{db_{P+1}^R}{db_{P+1}^B} < 0\right)$, such that the budget remains balanced. Optimality of the relative benefit policy for the unemployed in recession and boom requires that the following expression holds:

$$\underbrace{\frac{E_{P+1}^{u,R}[\omega(\bar{e}_i)u'(c_{i,P+1}^u)]}{E_{P+1}^{u,B}[\omega(\bar{e}_i)u'(c_{i,P+1}^u)]}}_{\text{Marginal Benefit}} = \underbrace{\frac{1 + FE^R}{1 + FE^B}}_{\text{Marginal Cost}} \quad (5)$$

The expression highlights the key statistics needed to evaluate the welfare implications of changes in unemployment benefit duration over the cycle. The left hand side refers to the marginal benefit, which captures the social benefits of UI, and is shown to depend on two terms. First, it depends on the ratio of welfare weights between those unemployed in recession and in boom. Given the definition of the types, note that only the differences in mean effort of the unemployed across the cycle that are driven by composition enter the welfare weights, and so changes in behavior are not considered. Second, it also depends on the ratio of marginal utilities of consumption between the unemployed in recession and in boom who are near the benefit exhaustion point.

The right hand side, which refers to the marginal cost and captures the efficiency costs of UI, depends on the relative extra costs — or fiscal externalities — due to labor supply distortions that are induced when increasing benefit duration in boom and recession.

This approach yields a characterization that is simple, yet remains valid under a wide range of assumptions about the underlying model. For example, the expression is robust to alternative dimensions of individual heterogeneity (e.g., job finding), and to different choice variables (e.g., reservations wages). Invoking the envelope theorem, individuals already optimize with respect to other variables before the policy change, so changes in these alternative variables in response to the policy change do not have a first-order effect on welfare. As a result, the highlighted expression is general, remaining valid to assess the welfare consequences of benefit duration extensions.

In summary, the expression implies that differentiating the UI policy with respect to economic conditions is welfare improving if and only if the marginal benefit is greater than the marginal cost. This motivates the empirical part of the paper, which implements the expression in order to assess the welfare consequences of the reform.

2.2 Implementation: Marginal Benefit

In order to connect the conceptual framework to the data, I follow a consumption-based approach ([Gruber, 1997](#); [Chetty, 2006](#); [Kolsrud et al., 2018; 2024](#)). The resulting approximated empirical counterpart of the marginal benefit term is:¹⁰

$$\frac{E_{P+1}^{u,R}[\omega(\bar{e}_i)u'(c_{i,P+1}^u)]}{E_{P+1}^{u,B}[\omega(\bar{e}_i)u'(c_{i,P+1}^u)]} \approx \underbrace{\frac{\omega^R}{\omega^B}}_{\text{Welfare Weights}} \underbrace{\frac{1 + \gamma \frac{c^{e,R} - c^{u,R}}{c^{e,R}}}{1 + \gamma \frac{c^{e,B} - c^{u,B}}{c^{e,B}}} \left[1 + \gamma \frac{c^{e,B} - c^{e,R}}{c^{e,B}} \right]}_{\text{Consumption Smoothing}} \quad (6)$$

The equation shows the main components behind the social benefits associated with UI reforms: the value of these transfers depends on both the relative welfare weights and relative consumption differences between the individuals unemployed at each moment of the business cycle.

Welfare Weights. UI benefit duration reforms that differentiate with respect to labor market conditions effectively transfer resources across different individuals. Beyond consumption differences, which are captured by the consumption smoothing term, the type of individuals who are unemployed in boom and recession may be different along other dimensions, which the planner may wish to capture ([Saez and Stantcheva, 2016](#)) when assessing the welfare effects of the reform. Specifically, here the focus is on incorporating a specific dimension — willingness to

¹⁰Further details are provided in Appendix B.2.

work (\bar{e}_i) — which may particularly vary with economic conditions.

In the event that preferences for redistribution depended on this dimension, the first best would be to target benefits based on \bar{e}_i , but individual effort is not observed. However, given the outlined framework, the moment of the cycle when people are unemployed reveals some information about their type. Intuitively, when the unemployment rate is low and there are many jobs available, search effort is very effective to find a job and so only the low-effort individuals will remain unemployed. In contrast, when the unemployment rate is high and there are fewer jobs available, labor supply becomes less relevant and even individuals who search hard are likely to remain unemployed, so the pool of unemployed shifts towards individuals who are, on average, of higher-effort types.

Given preferences, and the selection mechanism described, the average welfare weight for unemployed individuals may vary over the cycle given the differential dynamic selection of the unemployed. Thus, a planner that conditions benefits on aggregate conditions is imperfectly targeting individuals with different willingness to work (Akerlof, 1978).¹¹ The empirical part focuses on testing empirically these predictions and quantifying the different components of $(\frac{\omega^R}{\omega^B})$ — namely whether society has a preference for redistribution along the willingness-to-work dimension and whether the composition of the unemployed changes over the cycle. In addition, the main analysis is complemented with alternative quantification exercises where the welfare assessment only captures the effects under a standard (utilitarian) social planner that does not place different welfare weights across individuals.

Consumption Smoothing. The value provided by the transfers depends on the differences in marginal utility of consumption between the different groups of unemployed at each point of the cycle. The expression highlights two data moments which are relevant to assess the consumption component. First, the transfers provide insurance value, which is a function of a risk aversion parameter and the relative consumption changes upon job loss by the unemployed at different labor market conditions, as captured by the first term in the consumption smoothing component $(1 + \gamma \frac{c^{e,R} - c^{u,R}}{c^{e,R}}) / (1 + \gamma \frac{c^{e,B} - c^{u,B}}{c^{e,B}})$. Intuitively, the larger the consumption drop individuals experience upon unemployment, the higher the value of transferring resources towards that state of the world.

Second, the marginal utility of consumption for the unemployed can differ not only because of different ability to insure consumption over the cycle, but also due to pre-unemployment differences in consumption levels. This means that a benefit reform of this type could effectively

¹¹This idea applies more generally and could be implemented along other dimensions rather than national aggregate conditions, such as job availability in specific sectors or regions. Moreover, it is not necessary that all the selection along the willingness to work dimension occurs through dynamic selection over the unemployment spell, being also possible that composition shifts arise from differential layoff composition over the cycle.

redistribute across pre-unemployment consumption levels if there is differential selection in terms of consumption, as captured by the second term $(1 + \gamma \frac{c^{e,B} - c^{e,R}}{c^{e,B}})$.¹² The empirical analysis focuses on empirically assessing whether the marginal utility of consumption for the unemployed varies with economic conditions, by estimating how both the consumption changes upon job loss and pre-unemployment levels evolve over the cycle.

2.3 Implementation: Marginal Cost

When changing benefit generosity, affected unemployed individuals may take longer to find a job, which imposes an efficiency cost on the government budget. The fiscal externality capturing the extra cost due to labor supply distortions, induced by changing potential benefit duration, is:

$$\frac{1 + FE^R}{1 + FE^B} \approx \frac{1 + \frac{1}{S_{P+1}^R} \left[\frac{\partial D_b^R}{\partial b_{P+1}^R} b + \frac{\partial D^R}{\partial b_{P+1}^R} \tau \right]}{1 + \frac{1}{S_{P+1}^B} \left[\frac{\partial D_b^B}{\partial b_{P+1}^B} b + \frac{\partial D^B}{\partial b_{P+1}^B} \tau \right]} \quad (7)$$

where S_{P+1}^k is the share of individuals who remain unemployed in period $P+1$ at specific moment of the cycle k , and D_b^k and D^k refer to unemployment and nonemployment duration respectively.¹³ Unemployment duration refers to time spent receiving benefits, while nonemployment duration refers to time between job loss and start of the new job. Intuitively, when the benefit at the exhaustion point is marginally increased, unemployed individuals react by taking longer to find a job. This has a negative effect on the budget because people spend more time receiving benefits and also take longer to start paying taxes. The expression measures the cost in terms of the behavioral response induced by each euro transferred mechanically to the unemployed.

3 Institutional Background and Data

3.1 Great Recession and Unemployment Insurance System in Spain

Great Recession. The Spanish Great Recession was characterized by a strong boom period over the years up to 2007, followed by a slowdown in 2008 and then a substantial bust in the subsequent years. Internal demand had increased by around 20% in real terms since the early 2000s over the years leading up to the recession (Almunia et al., 2021). The rapid growth was in large part due to an increasingly important construction sector, which accounted for 12.4% of Spain's GDP at the peak in 2007. The growth, incentivized by the relatively cheap credit available

¹²See Kolsrud et al. (2024) for a similar setting in the context of pension benefit reforms.

¹³The approximation relies on the effect of extending benefit duration in a given economic condition having small effect of individuals' behavior while unemployed in other economic conditions. See Appendix B.1 for further details.

in the Spanish economy, fueled a substantial housing boom (Martínez-Toledano, 2020). With a one year delay, after the unraveling of the subprime mortgage market in the US, the reduction in credit supply affected the real economy, which led to a collapse in internal demand together with a massive reduction in the importance of this sector, which was 5.4% of GDP by 2014. Overall, this resulted into large effects that extended across sectors, having a substantial impact in terms of labor market outcomes. The national unemployment rate skyrocketed from 7.9% to 26.9% over a period of 6 years. As mentioned before, this magnitude is remarkable relative to international standards as shown in Figure A1.

UI System. The Spanish UI system is a national program financed via payroll taxes. Benefit levels and durations are set by the central government and are the same for all regions. In order to qualify for unemployment insurance, a worker must become unemployed involuntarily and have worked for at least 1 year within the last 6 years after the last time of UI reception. Individuals who quit voluntarily, receive full-time disability benefits or whose age is above 65 are not eligible to get UI. Potential benefit duration — the maximum time an individual can spend receiving UI benefits — is a function of work experience within the last 6 years before becoming unemployed. This duration is invariant over the business cycle. It is similar to systems in other countries in Western Europe such as Germany, and different from countries such as the US where the duration is usually extended when the economy is in a bad state. Specifically, potential benefit duration ranges from 4 to 24 months, increasing by two months every six months worked. In relation to benefit levels, they are determined as a function of pre-unemployment labor income and individual characteristics. The labor income considered is average gross earnings within the last 6 months and the replacement rate is 70%, getting reduced to 60% after 6 months unemployed.¹⁴ From July 2012 onwards, the latter replacement rate was set to 50%. After UI benefit exhaustion and depending on individual characteristics, individuals remaining unemployed may apply for unemployment assistance.

3.2 Data

Preferences for Redistribution. I design and administer an online survey to understand preferences for redistribution between the unemployed based on search effort types. To do so, I program a new survey using oTree and partner with the company Respondi/Bilendi to obtain respondents from Spain. This panel company has been previously used in the literature for other studies (e.g., Alesina et al., 2018; 2023). The survey was administered in August 2023,

¹⁴In the stylized model, I focus on the duration of the benefits and make the simplifying assumption that the benefit level is constant up to the exhaustion point. See e.g. Kolsrud et al. (2018) for work considering variation in benefit profiles over the unemployment spell.

with a sample size of N=1022, and respondents being rewarded with €1.15 for an average completion time of 8 minutes. The sample is representative of the Spanish active population aged 25-64. The data collection was performed to target 24 age-education-sex-employment cells based on the Spanish Labor Force Survey (*Encuesta de Población Activa*).¹⁵ In order to maintain data quality, I further restrict the sample to individuals with a completion time between the 5 and 95 percentiles, and whose answers to the qualitative and quantitative questions explained below are consistent. This results in a final sample of 709 individuals. In order to address order effects, and understand reasons behind the responses, the survey has features such as order randomization and open-ended questions to make sure that results are not driven by specific characteristics of the implementation.¹⁶

The survey first starts with a section collecting information on demographics and labor market status. It then elicits respondents' preferences for redistribution between the unemployed based on effort types, in both qualitative and quantitative ways. To do so, respondents are presented with scenarios where they are asked to allocate government funds between two individuals with different search effort behavior in the previous week, allowing to estimate relative valuations between them. Finally, the survey concludes with open-ended questions to understand the reasons for their choices, and multiple choice questions to know whether they would support a hypothetical UI reform of the type studied in the paper. Appendix C provides more detailed information about the survey structure including the full questionnaire.

Search Effort. The main measure of search effort is constructed from the Spanish Time Use Survey (*Encuesta de Empleo del Tiempo*). Specifically, in order to explore variation over the business cycle, I use the two available waves in years 2002-2003 and 2009-2010. The survey is harmonized at the European level by Eurostat as part of the Harmonized European Time Use Surveys, and is similar to the American Time Use Survey (ATUS). Its objective is quantifying the time spent by individuals on various activities throughout the day. To that end, respondents fill questionnaires and time diaries where they record their daily activities in 10-minute slots over one day, so the survey structure is a cross section.

For the analysis, I focus on the unemployed aged 25-64 and use the information available on job-search-related activities to construct a measure capturing whether individuals report searching for jobs in a given day. Similarly to the consumption data, the dataset does not contain information on unemployment duration or potential benefit duration, so I focus on the behavior of all unemployed instead of individuals just around the benefit exhaustion point. More details

¹⁵In terms of implementation, the panel company sends invites to their sample of individuals recently active in their platform who fulfill the criteria, and I only observe them conditional on accepting the invite. The company's reported response rate is approximately 50%.

¹⁶For a recent review on recommended survey practices in the literature, see [Stantcheva \(2023\)](#).

on the construction of the search effort measure are presented in Appendix D.

Consumption. I use household expenditure survey data from the Spanish EPF (*Encuesta de Presupuestos Familiares*) over 2006-2015. This yearly survey provides detailed diary-based information on household consumption, labor market status, and demographic characteristics. It is available over a long period of time, so proves useful to study dynamics over the business cycle far from the current period.¹⁷ The survey has a panel dimension, with households being followed for two consecutive years, and contains 80 consumption categories which are classified following the COICOP/HBS classification. It accounts for 87% of aggregate consumption, which compares favorably to figures obtained in other countries (Heathcote et al., 2010; Campos and Reggio, 2015). A limitation, shared with other surveys, is that unemployment duration or potential benefit duration are not present in the dataset. Thus, the empirical analysis focuses on consumption patterns of the average unemployed around job loss, and not specifically on those at the moment of benefit exhaustion.

I construct an expenditure measure that includes expenditure on a wide variety of goods and services: Food, Alcohol/tobacco, Clothing, Housing, Inventories, Health, Transport, Telecom, Recreation, Education, Hotels.¹⁸ I exclude rent for homeowners (which is imputed), and deflate this measure using annual CPI. I restrict my sample to household heads aged 25-64 who were either employed in both periods or employed in t and unemployed in $t + 1$, and had less than a threefold change in consumption (Gruber, 1997; Kroft and Notowidigdo, 2016; Hendren, 2017).

Unemployment Spells. Information on unemployment spells and unemployment benefit transfers comes from the Social Security administrative records of the Continuous Sample of Employment Histories (*Muestra Continua de Vidas Laborales*). They are effectively matched employer-employee data with daily longitudinal information created by matching income tax data, Social Security records and census data. They cover a 4% non-stratified random sample of individuals that, for any year, have a relationship with the Social Security. The datasets comprise the years 2006-2017 and are used to build a sample containing the complete history of employment and unemployment spells since entrance in the labor market for individuals who had any relationship with Spain's Social Security during those years. I observe both unemployment duration (days receiving unemployment benefits) and nonemployment duration (days between the start of UI reception and the beginning of a new employment spell). An important variable in the analysis is potential benefit duration, which is not present in the dataset. For this reason, I compute it applying the UI eligibility rules to the working history of every individual. For

¹⁷The waves covered here correspond to an improved version of the survey where the sample size, duration of households' diaries completion and quality have increased substantially with respect to previous waves (INE, 2008).

¹⁸This corresponds to a more comprehensive version of the expenditure measure in Campos and Reggio (2019).

the main analysis, given difficulties in the empirical computation of potential benefit duration, I focus on prime-age individuals with PBD between 8 and 22 months.¹⁹ I cap my measure of nonemployment duration at 3 years (e.g., Schmieder et al., 2012; Lindner and Reizer, 2019).

Unemployment Rate and Demographics. The information on economic conditions is based on the microdata files of the Labor Force Survey (*Encuesta de Población Activa*) provided by the National Statistics Institute (INE). I compute unemployment rate measures at the region-year level over the period 2006-2017 for the analysis of the different components over the business cycle. Given differences in availability of geographical information across datasets, regions correspond to (52) provinces in the unemployment spell analysis, and (17) autonomous communities (CCAA) in the consumption and search effort analyses. I also use this dataset for two additional tasks: (i) obtaining shares of population for each demographic cell to achieve representativeness of the online survey; (ii) performing the prediction exercise based on search effort as described in Section 4.1.2.

4 Empirical Approach and Results

The framework described in Section 2 guides the empirical analysis, which aims to recover the required statistics for assessing the welfare effects of UI reforms that make benefit duration contingent on labor market conditions. I start by examining the evolution of the welfare weights and consumption moments, and continue analyzing the efficiency cost of the transfers.

4.1 Estimating Welfare Weights

A key statistic to evaluate how the social benefits provided by UI transfers vary with economic conditions is the ratio of welfare weights. Specifically, these weights capture society's relative valuations between the type of unemployed individuals receiving the transfers at different moments of the cycle, who may differ in their general attitudes towards job search.

¹⁹I focus on individuals with PBD from 8 to 22 months, discarding the cutoffs at the bottom and at the very top. Given these rules together with short contracts for individuals located around the first cutoffs, apparent bunching appears near these cutoffs. The last cutoff also presents bunching which is mechanical, given that the maximum work experience counted is 6 years, and those individuals tend to have been employed longer than that. In addition, I focus on individuals aged 26-54 given the longer work spells that enable better assignment into treatment, and the lower likelihood to be impacted by retirement and unemployment assistance policies. Given the statutory rules, an individual who gets unemployed but does not exhaust the PBD and works for a certain amount of time, can choose upon job loss what the new PBD will be between two alternatives: the remaining months from the old spell and the new ones. This information is missing in the data and thus makes the assignment of the running variable more difficult so I also restrict to the first spell of each individual in the sample. I also discard individuals whose previous job was less than part time, whose unemployment spell was not immediately preceded by an involuntary job loss, and whose unemployment spell was suspended. Finally, the most recent individuals included are the ones becoming unemployed in 2014, so that there are at least three years after the start of UI reception for everyone in the sample.

To estimate this parameter, I proceed in three steps. First, I examine preferences for redistribution between individuals of different willingness-to-work types. Second, I analyze whether the composition of the unemployed changes along the willingness-to-work dimension over the cycle. Third, I combine both results in order to estimate the ratio of welfare weights between the unemployed in recession and the unemployed in boom.

4.1.1 Preferences for Redistribution over Willingness-to-Work Types

I build on the insights from the generalized social marginal welfare weights approach of [Saez and Stantcheva \(2016\)](#) in order to understand whether society has a preference for redistribution over the willingness-to-work dimension. To operationalize this, I design and administer an online survey to estimate the statistics of interest highlighted by the framework. Here I describe the key questions, and refer the reader to Appendix C for more detailed information.

After responding a set of demographic questions, individuals are shown the first question that is intended to elicit preferences for redistribution in a qualitative way. The question reads as follows:²⁰

Imagine there are 2 unemployed individuals, A and B, who receive €950 while unemployed and are entitled to receive benefits for up to 14 months if remaining unemployed:

- A looked for jobs last week*
- B did not look for jobs last week*

The government wants to transfer €1000 to individuals A and B in a one-time payment, and is thinking of how to allocate them. Please choose what allocation option you would prefer:

- *More money to A than to B*
- *More money to B than to A*
- *Same amount to A and B*

The answers to this question are shown in Panel (a) of Figure 1, which illustrates that around 75% of respondents prefer to allocate more resources to the individual who was looking for work in the previous week. Almost all of the other respondents would allocate the same resources to both individuals —meaning that they would not redistribute based on this dimension—, with virtually no respondents preferring to give more to the individual who did not search.

Although a stark qualitative picture emerges from the answers to this question, this is not enough to estimate the relative valuations between types. Therefore, in order to make progress

²⁰Note that the specific hypothetical benefit amount and potential duration correspond to the national average at the time of the survey as reported by the Spanish Employment Agency (SEPE).

on that front, after the qualitative question, respondents are presented with 10 quantitative questions designed to obtain the statistic we are after. They are of the following form:

Imagine there are 2 unemployed individuals, A and B, who receive €950 while unemployed and are entitled to receive benefits for up to 14 months if remaining unemployed:

A looked for jobs last week

B did not look for jobs last week

The government wants to transfer €1000 to individuals A and B in a one-time payment, and is thinking of how to allocate them. Now imagine that an unequal allocation may be costly. That is, it can allocate €500 each, or more to one than the other, but the latter option may result in the total amount of resources that can be distributed being reduced. Please choose what allocation option you would prefer:

- 500 for A and 500 for B
- 550 for A and 400 for B

For each of these 10 questions, there are always two allocation options: one offering the same amount for both individuals, and the other one where the amounts differ between them. Under the equal allocation option, both individuals receive the same amount of €500 (i.e. $r_0^A = r_0^B = 500$). Under the alternative option, one individual gets €550 ($r_1^A = 550$) and the other individual an amount r_1^B obtained from the set $\{50, 100, 150, 200, 250, 300, 350, 400, 450\}$.²¹ The identity of individuals A and B, the order of questions, as well as the order in which the equal allocation option appears within the question are all randomized. This intends to alleviate concerns about order effects.²² In practice, the experimental variation created in the cost of the transfer, or Marginal Rate of Transformation (MRT), allows to identify the relative valuation over individuals, or Marginal Rate of Substitution (MRS), and induces individuals to accept the unequal allocation whenever:

$$\frac{\omega(\bar{e}_A)}{\omega(\bar{e}_B)} = MRS \geq MRT = \frac{r_0^B - r_1^B}{r_1^A - r_0^A} \quad (8)$$

Panel (b) of Figure 1 depicts the share of individuals who choose an unequal allocation for different values of the cost of the transfer. First, the figure shows that when the cost of the transfer is low, a large share of respondents choose the unequal allocation that gives more to individual A. Specifically, when there is no cost of transferring resources between individuals (MRT=1), the

²¹In practice, all individuals are presented with the same two options of 550 to A (B) and 450 to B (A). This allows me to assess data quality by comparing answers, for the same individual, to a question with no cost of transfer and asked in both qualitative and quantitative way. The other 8 questions are randomly drawn from the remaining set of transfer amounts.

²²Note that the fact that each individual is presented only with 10 of these questions, and that there is order randomization, only has the objective of reducing fatigue and increasing data quality.

share is around 75%, which equals the figure obtained in the qualitative question.²³ Moreover, the share declines as the cost increases, implying lower willingness to redistribute as more resources are lost to implement a given transfer. Overall, respondents exhibit a strong preference for redistribution from the individual who did not search last week and towards the one who searched. However, when asked to redistribute in the opposite direction, towards the individual who did not search, almost no one is in favor of that allocation. Leveraging the responses of individuals, I estimate the relative valuation (or average marginal rate of substitution) between the type of individual A and B as follows:

$$\frac{\omega(\bar{e}_A)}{\omega(\bar{e}_B)} = \sum_j (s_j - s_{j+1}) MRT_j \quad (9)$$

where s_j corresponds to the share of individuals accepting an unequal allocation when presented with an allocation option of cost MRT_j . Thus, I effectively compute a weighted average of the (binned) MRS distribution by summing over bins corresponding to all MRT values. Given the relatively high share still present at the largest cost considered in the design (MRT=9), my preferred specification assumes a linear extrapolation with a downward slope as estimated over the range before that point. Following this approach I obtain that $\frac{\omega(\bar{e}_A)}{\omega(\bar{e}_B)} = 12.8$, which reveals that respondents have a strong preference for targeting resources at individuals who exert effort.²⁴ Intuitively, this indicates a valuation of a €1 euro transfer to the individual who did not search for jobs at only €0.08 of the value placed on an equivalent €1 transfer to the individual who searched for jobs last week.

Preference heterogeneity. I examine whether the average preferences for redistribution elicited reflect homogeneity or are instead driven by specific groups. Results are shown in Figure A2. The findings reveal that preferences are remarkably homogeneous, even among groups that may be more likely to benefit from the policy. Unemployed individuals present slightly lower support for redistribution based on willingness to work relative to the employed, but still more than 50% wish to reward effort. While the baseline implementation elicits preferences for redistribution between types while fixing the economic environment, it could be the case that the welfare weight function also depends on economic conditions itself, on top of the unemployed's composition changes. To explore the importance of this issue, I examine whether preferences are heterogeneous by the unemployment rate of the respondents' region, and find that

²³As mentioned before in Section 3.2, the final sample excludes individuals that provide contradictory responses to the same question, asked in both a qualitative and a quantitative way.

²⁴Without extrapolating, assuming that all individuals at the upper tail of the distribution have exactly MRS=9, I obtain a lower bound of $\frac{\omega(\bar{e}_A)}{\omega(\bar{e}_B)} = 4$. As I show later, since the main statistic of interest is a ratio of welfare weights between the unemployed in boom and recession, the same assumption is made in both nominator and denominator and so results are not very sensitive to this issue.

preferences are stable across economic conditions. I also consider whether previous experiences of respondents, during their impressionable years (18-25) (Krosnick and Alwin, 1989), affect their stated preferences. Specifically, I do not find that factors such as long-term unemployment of the parents or household's economic difficulties during this important period impact preferences along the willingness-to-work dimension.

Dimension of interest. It is plausible that respondents support redistribution based on effort, not due to a direct concern for effort itself, but rather because of some other underlying factor that correlates with this dimension. In order to understand what respondents have in mind when answering the questions, I ask them open-ended questions about the reasons for their allocations. A wordcloud with their answers is depicted in Panel (c) of Figure 1, where the most common expressions include "search for job", "effort" and "reward", implying that they directly consider as relevant the main dimension of interest.²⁵

4.1.2 Unemployed's Composition

The second piece of information required is whether the composition of the unemployed shifts towards high-willingness-to-work types when economic conditions worsen. Intuitively, when labor demand falls during recessions, the offer arrival rate declines, search effort becomes less effective in terms of job finding, and a selection mechanism arises such that, all else equal, high-effort types are more likely to remain unemployed than when the overall unemployment rate is low. Here I provide empirical evidence that demonstrates the relevance of this mechanism.²⁶

To do so, building on the survey evidence, I focus on the following measure: share of unemployed who search for jobs in a given week.²⁷ Specifically, attention is restricted to how this

²⁵Nevertheless, although respondents care about the effort dimension per se, there seems to be an understanding of confounders and heterogeneity in the population. For example, the analysis of the open-ended answers reveals that some individuals have in mind the case of single mothers with kids. They suggest that, despite this group potentially exerting less effort compared to others, they prefer not to support redistribution based on the effort dimension in this context, consistent with the results of the qualitative question. For this reason, the question used to elicit preferences intentionally does not fix other characteristics of the hypothetical individuals beyond the benefit policy, given that the unemployed's composition may change over the cycle along various dimensions in addition to effort. As a result, while understanding how preferences for redistribution vary depending on the source of effort differences is beyond the scope of this paper, the exercise below, which estimates welfare weights over the cycle, accounts for changes in the composition of the unemployed along dimensions that correlate with effort to the extent that respondents incorporate that heterogeneity/correlation. In relation to this, it is also important to note that the question fixes the potential unemployment benefit policy, and the transfers are lump-sum. This aims to obtain responses that are orthogonal to differences in consumption and to capture preferences based on effort.

²⁶As mentioned before, since the statistic of interest is average willingness to work over the cycle, it is not necessary that the main mechanism driving composition changes is a decrease in job finding in bad times. This could also be explained by a different composition of layoffs.

²⁷This measure captures an intensive margin of job search. Given that according to the International Labour Organization (ILO) definition of unemployment, a requirement to be considered unemployed is to have searched for jobs in the last month, this explores the degree of search intensity within that period. It is also a relevant measure considered in other surveys like the Survey of Consumer Expectations (SCE) carried out by the Federal Reserve

measure changes with economic conditions, but only to the extent that is driven by a composition shift. As described before, given that the unemployed may change their search effort behavior in response to changes in the offer arrival rate over the cycle, the measure of type considers effort conditional on economic conditions by fixing effort at the level that would be observed were the unemployed faced with an offer arrival rate as in boom (i.e. unemployment rate of 8%).

I leverage the two available waves of Spanish Time Use data (2002-2003 and 2009-2010).²⁸ Exploiting the variation in unemployment rate across regions over the two time periods, I obtain the results shown in Panel (e) of Figure 1.²⁹ The figure shows that the share of individuals who search in a given week increases strongly with the unemployment rate. Specifically, it goes from around 50% when the unemployment rate is 8% to more than 80% when the unemployment rate exceeds 20%.

Importantly, not all the fluctuations in search effort are potentially due to a composition effect.³⁰ As mentioned before, individuals may also change their search behavior while unemployed in response to changes in the availability of jobs. Evidence from Mukoyama et al. (2018) with panel data from the US indicates that around 50% of the effort increase observed over the cycle is due to a composition effect, with both observable and unobservable dimensions playing an important role.³¹ Applying this magnitude to my context in order to only consider changes due to composition, I obtain that the share of unemployed individuals searching in a given week increases with the unemployment rate, going from 49% in boom to 68% in recession.

For the estimation of the welfare weights below, I perform a sensitivity analysis where I consider different magnitudes for the change due to composition effects. In addition, I also perform a complementary prediction exercise using only Spanish data, where I predict search effort based on the set of demographics present in both the Time Use data and the Labor Force Survey. Specifically, I estimate the relationship between search effort and the demographic characteristics based on the Time Use data and then impute search effort in the Labor Force Survey using the same demographics.³² Note that the set of demographics in both datasets is limited and the

Bank of New York (Faberman et al., 2022).

²⁸For more details on data construction, see Appendix D.

²⁹Given data availability the analysis uses only two years, and residualizes the variables on region FEs to not consider variation from structural differences across regions that are constant over time. Note that the relationship documented is not only present in Spain, and does not depend on the specific search effort measure or the specification used. See Table A1 for evidence of overall countercyclicality of usage of different search methods over 15 years across 34 countries using data from Eurostat.

³⁰For related literature that investigates the drivers of the cyclicity in the job finding rate instead of search effort, see e.g., Kroft et al. (2016) and Mueller and Spinnewijn (2023).

³¹The authors use market tightness as the measure of economic conditions and minutes of search as the measure of search effort. They exploit the panel dimension of the Current Population Survey (CPS) to account for both observables and unobservables. Findings from their working paper using unemployment rate instead present similar results.

³²For this exercise, given the availability of only two waves of the Time Use Survey, I focus on the years up to

cross-sectional nature of the dataset used from the Labor Force Survey for this analysis does not allow to account for unobservables, so this provides a lower bound on the magnitude of composition shift over the cycle that I can detect relative to the richer data setup in Mukoyama et al. (2018).³³ Nonetheless, Figure A4 reassuringly shows that predicted search effort changes over the business cycle, even when only considering this limited set of demographics present in the Spanish data.

4.1.3 Combining Information: Unemployed in Recessions vs Boom

The previous sections showed that society exhibits strong preferences for transferring resources from low- to high-willingness-to-work individuals. Moreover, the composition of the unemployed shifts towards high-willingness-to-work types in bad times. Here I combine both pieces of information to obtain an estimate of how society values transfers between the unemployed in recession and boom given the changes in composition along the effort dimension.

From before, we have $\frac{\omega(\bar{e}_A)}{\omega(\bar{e}_B)} = 12.8$. Then, from the exercise employing Time Use data we have that the shares of each effort type in boom and recession are:

$s_A^{Boom} = 0.49$; $s_B^{Boom} = 0.51$; $s_A^{Recess.} = 0.68$; $s_B^{Recess.} = 0.32$. After that, I compute $\omega^R = (s_A^{Recess.})\omega(\bar{e}_A) + (s_B^{Recess.})\omega(\bar{e}_B)$ and $\omega^B = (s_A^{Boom})\omega(\bar{e}_A) + (s_B^{Boom})\omega(\bar{e}_B)$. As a result, I estimate a ratio of welfare weights $\frac{\omega^R}{\omega^B} = 1.31$, which indicates that society values a €1 transfer to the type of individuals unemployed in recession as much as €1.31 to those unemployed during a boom.

Composition changes along willingness to work. The baseline results documented in this section rely on an assumption about changes in the composition of the unemployed. Here I explore how sensitive estimates of the ratio of welfare weights are to implementation assumptions. On the one hand, under the strong assumption that the distribution of MRS does not have values larger than the ones randomized, we get a ratio of 1.22. On the other hand, using the baseline estimate, even if the part of the search effort increase in recession that is due to composition is 25% — half of the one found in the US —, the magnitude is 1.15. Alternatively, using the variation in effort due to composition effects obtained from the prediction exercise that only uses the Spanish Time use data combined with LFS, I obtain a similar magnitude: 1.13. As explained before, this likely understates the composition shift given that the design does not account for

2010 which is the last period for which search effort is actually observed and so we can compare measured search effort with predicted (by composition) search effort. The demographics present in both datasets that are used in the prediction model are interactions between age categories and sex; between education categories and sex; and between married status and sex.

³³Recently secured access to Spain's longitudinal Labor Force Survey, which follows unemployed individuals over time, allows for a complementary exercise with individual fixed effects, thereby cleanly separating true composition shifts from within-individual changes in search effort over the cycle — as proxied by search methods used. Exploratory evidence is in line with the main results obtained across different approaches, providing further confirmation to the conclusions.

unobservables and the predictors set present in the data is sparse. Assuming all change is due to composition effects, the magnitude is 1.5. Overall, the values remain close to the baseline estimate of 1.31.

This implies strong preferences for redistribution along the specific effort dimension, a result that is robust to different implementation assumptions. In summary, the findings demonstrate that there is an important shift in the composition of the unemployed over the cycle, and that society values substantially more transfers towards the type of individuals who tend to be unemployed in bad times.

4.2 Estimating Consumption Smoothing

In addition to the ratio of welfare weights, the second key element needed to assess the social benefits of UI transfers is how moments of consumption during unemployment vary with labor market conditions. As mentioned before, differences in consumption while unemployed for two groups of individuals (unemployed in recessions vs boom) depend on both consumption changes upon job loss and pre-unemployment consumption levels.

I start by evaluating how individuals change their consumption upon unemployment, and whether this change varies over the cycle. This sheds light on the relative insurance value of providing more generous UI transfers in bad times relative to good times. To quantify these patterns, I adopt a difference-in-differences strategy similar to [Gruber \(1997\)](#), where I compare the consumption behavior of household heads getting unemployed with those who remain employed over the business cycle. Specifically, I estimate the following model:

$$\log C_{it} = \beta_0 + \beta_1 Unemployed_{it} + \beta_2 Unemployed_{it} \times U.Rate_{r(i,t)t} + \lambda_i + \lambda_{r(i,t)} + \lambda_t + X'\beta + \varepsilon_{it} \quad (10)$$

where $\log C_{it}$ refers to log consumption measured at the household level, $Unemployed_{it}$ is a dummy variable that equals one when the household head is unemployed, $U.Rate_{r(i,t)t}$ refers to the unemployment rate in the region where individual i lives at time t , and λ_i , $\lambda_{r(i,t)}$, λ_t are individual, region and year fixed effects, respectively. The vector of controls X includes the regional unemployment rate, and information on type of household.³⁴

[Table 1](#) shows the main results on consumption changes upon job loss. First, in column (1) of Panel A, we see that, on average, individuals experience a 9.6% (s.e. 1.3%) consumption drop upon unemployment. From column (2) of Panel A, which is the baseline specification, we see that the average consumption drop masks a clear gradient with respect to economic

³⁴The latter is solely intended to keep household size fixed since the consumption measure is at the household level.

conditions. A 1 p.p. increase in unemployment rate results in an additional -0.4% (s.e. 0.1%) change in consumption relative to pre-unemployment level. From column (3) of Panel A, which includes region-times-year fixed effects, we see that the consumption drop covaries similarly with economic conditions. Columns (4)-(6) of Panel A include additional covariates that intend to capture changes in household composition. Results are very similar to the ones without these covariates. Panels B and C present the estimated consumption changes upon job loss at unemployment rates corresponding to boom and recession. The estimates go from approximately 4% to 11%, respectively, and are statistically different from each other.

Panel (a) of Figure 2 depicts the main result, focusing on the baseline specification and grouping individuals by their regional unemployment rate. The groups are selected so that the average unemployment rate in each group roughly approximates the national average in boom, normal times, and recession. It shows that the within individual change in consumption between employment and unemployment gets significantly and monotonically larger when the unemployment rate increases. This is in contrast to the findings of Kroft and Notowidigdo (2016), where the authors do not find that the individual drop gets larger when economic conditions deteriorate. The difference in findings may be explained by limited power to detect an effect in their study given the relatively small sample size and/or variation in unemployment rate, and the fact that the consumption measure only captures food components. In my setting, there is relatively larger variation in economic conditions and a more comprehensive consumption measure that goes beyond food consumption, which allows me to revisit this issue and obtain further insights.

To do so, I decompose the change in the consumption drop over the cycle by consumption category in order to understand which components of the consumption basket drive the cyclicalities of the overall drop. Specifically, I estimate models of the form:

$$Y_{it}^j = \beta_0^j + \beta_1^j Unemployed_{it} + \beta_2^j Unemployed_{it} \times U.Rate_{r(i,t)t} + \lambda_i + \lambda_{r(i,t)} + \lambda_t + X'\beta + \varepsilon_{it} \quad (11)$$

where $Y_{it}^j = \frac{C_{it}^j}{\sum_j C_{it(h(i))}^j}$ refers to the individual's consumption within category j relative to overall consumption of the individual in the first year observed in the sample, which is denoted as her cohort year $h(i)$. Note that considering shares, with consumption in each category being relative to the overall in previous year provides a clear interpretation, since adding up all the estimates across categories yields the total change in the consumption drop documented before (Table 1).³⁵ For each category, I compute the difference between the consumption change in

³⁵It also allows a direct mapping across specifications by focusing on the same set of individuals, including those reporting no consumption for a given category at a given point.

recession and the change in boom.³⁶ I focus on the preferred specification (column (2) in Table 1), now analyzing consumption shares. The results are depicted in Panel (b) of Figure 2, where the drop in food consumption upon unemployment gets somehow larger in bad times but the magnitude is not statistically significant. Nonetheless, the larger drop in overall consumption in recession arises mainly from larger drops in a few consumption categories: housing, utilities, and clothing and shoes.³⁷³⁸ Therefore, my findings can help reconcile the empirical result in Kroft and Notowidigdo (2016). Although their theoretical model predicted a larger consumption drop in bad times, they find that it does not significantly vary with economic conditions when measured only by the food component. Given my findings, it thus seems that focusing only on a component such as food consumption that is relatively inelastic may limit the understanding of the welfare costs of job loss.³⁹ Therefore, this result highlights the importance of empirically assessing consumption behavior using a more comprehensive measure.

After analyzing consumption changes, I turn to evaluating differences in pre-unemployment consumption levels across the unemployed in different economic conditions. This complements the focus on the insurance value and sheds light into the distributional aspect of the transfers. Specifically, with the aim of focusing on pre-unemployment consumption for this exercise, I restrict the sample to only consider the first year in which the individuals are observed in the data, when they are all employed. I consider a version of equation (10) where I compare individuals who lose their job next period with those who remain employed. Specifically, I estimate the following regression equation:

$$\log C_{it} = \beta_0 + \beta_1 Unemployed(t+1)_{it} + \beta_2 Unemployed(t+1)_{it} \times U.Rate_{r(i,t)t} + \lambda_{r(i,t)} + \lambda_t + X'\beta + \varepsilon_{it} \quad (12)$$

where $Unemployed(t+1)_{it}$ is a dummy variable that equals one when the household head is unemployed in the next year, and zero otherwise. The results are shown in Table 2, which examines whether the pre-unemployment gap in consumption for individuals who become

³⁶This statistic is computed as $\beta_2^j \times (U.Rate^R - U.Rate^B)$, where economic conditions are defined as recession corresponding to 26% and boom to 8% unemployment rate.

³⁷Note that the design compares the consumption behavior of the unemployed relative to employed individuals in the same region and time period, so that the results are not explained by aggregate shocks that are common across groups such as the housing boom and bust documented in Section 3.1.

³⁸The specific categories where consumption changes become most pronounced with labor market conditions may differ in their degree of durability relative to the average category. Therefore, when evaluating consumption-smoothing benefits they would correspond to a different curvature. Although accounting for category-specific curvature is beyond the scope of this paper, the fact that consumption changes across categories are non-positive implies that the finding of larger welfare gains arising from consumption smoothing in bad times is robust to heterogeneity in preferences across categories.

³⁹Although it is sufficient in theory to just use food consumption — provided that one uses the appropriate curvature of utility over food (Chetty, 2006) —, in practice obtaining estimates that are precise enough to detect cyclical variations in this component may be difficult.

unemployed relative to those who do not change over the business cycle. Columns (1)-(6) indicate that there exists a pre-unemployment consumption gap which does not change with economic conditions. This evidence implies that although the UI system redistributes between people of different pre-layoff consumption levels, it does not do so differentially in booms and recessions. Therefore, the lack of variation of this component, together with the evidence on consumption drops, suggests that the insurance component is the main driver of consumption differences during unemployment between the individuals losing their jobs under different economic conditions.

Sensitivity of consumption evidence. Further analysis presented in Table A2 explores mechanisms and sensitivity of the main results regarding consumption smoothing. While the findings above reveal that overall consumption drops are larger in bad times, here I examine whether this is solely driven by longer unemployment duration in recessions. Results are robust to controlling by either regional unemployment duration or regional unemployment duration distribution (share of unemployed longer than 6 months). This suggests that the larger drop found in bad times is not fully explained by longer unemployment spells, with larger drops at a given duration potentially being the main driver.⁴⁰ Furthermore, I assess whether the 2012 reform which slightly decreased the replacement rate after 6 months (see Section 3.1) can mechanically explain the countercyclical drop in consumption.⁴¹ The findings indicate that this policy change does not drive the main results. Consequently, the evidence is consistent with other factors in addition to longer unemployment durations, such as lower individual asset levels in bad times, leading to larger consumption drops even conditional on unemployment duration.

Overall, the results here have shown that consumption smoothing varies substantially over the cycle, with the unemployed in bad times suffering considerably larger consumption drops upon unemployment than the unemployed in good times. Moreover, this larger drop arises from countercyclical drops in non-food categories such as housing and utilities, and clothing.

4.3 Estimating Efficiency Cost

When increasing potential benefit duration, individuals may change their search behavior and thus impose some extra cost on the government budget. Equation (7) highlights the main statistics needed to quantify this component, namely the marginal effect of potential benefit

⁴⁰Kolsrud et al. (2018) show that the consumption drop gets larger over the unemployment spell in the Swedish context. Unfortunately, a measure of unemployment duration is not available at the individual level in the Spanish consumption data, so I construct it at the region-year level from the LFS, potentially introducing some measurement error that may attenuate the results.

⁴¹An alternative explanation for the lower ability to smooth consumption in bad times could be that effective potential benefit duration in the sample decreases in bad times, mechanically reducing benefit generosity. I explore this aspect and find it is not the case.

duration on unemployment $\frac{dD_b^k}{db_{P+1}^k}$ and nonemployment duration $\frac{dD^k}{db_{P+1}^k}$, and the exhaustion rate S_{P+1}^k .

In order to gain a better understanding of the effect of PBD on unemployment and nonemployment duration, I start by providing graphical evidence of the behavior exhibited by unemployed individuals when entitled to additional benefit generosity. As outlined before, the institutional setup delivers a treatment assignment mechanism typical of a regression discontinuity design, and thus my empirical strategy exploits the discontinuities in potential benefit duration present in the UI system. Figure A5 illustrates the structure of the UI system for the main sample, where it is shown that PBD discretely increases by 2 months at specific cutoffs of recent work experience. To estimate the statistics of interest, the empirical approach pools all cutoffs together. First, I provide evidence for the validity of the design in two ways: testing whether there is any discontinuity in the density of the running variable following McCrary (2008), and assessing whether selection on observables could explain the effects on the outcomes of interest (Card et al., 2015). The reported test statistic does not reject the null hypothesis of no density discontinuity, and the covariate index of the outcomes also evolves smoothly at the threshold as depicted in Figure A6. Second, I proceed to analyze the impact of higher benefit generosity on the main labor market outcomes as shown in Figure 3. Panel (a) shows the discontinuity in PBD that arises when crossing the cutoff. Panels (b) and (c) depict the conditional expectation functions of unemployment and nonemployment duration, which also present discrete jumps exactly at the cutoff, consistent with PBD having a positive effect on both outcomes. To quantify these effects, I estimate models of the following form:

$$Y_{it} = \beta_0 + \beta_1 \mathbb{1}[Experience_i > 0] + \beta_2 \mathbb{1}[Experience_i > 0] \times U.Rate_{r(i,t)t} + \lambda_{r(i,t)} + \lambda_t + X'\beta + \varepsilon_{it} \quad (13)$$

where Y_{it} refers to potential benefit duration, unemployment duration and nonemployment duration, $\mathbb{1}[Experience_i > 0]$ is a dummy for being on the right side of the normalized cutoff, $U.Rate_{r(i,t)t}$ refers to unemployment rate at the region level from the quarter when the individual became unemployed, $\lambda_{r(i,t)}$ and λ_t are region and time fixed effects, respectively, and X is a set of controls including the regional unemployment rate and a (linear) polynomial in normalized work experience within the last 6 years which is allowed to have a different slope at each side of the cutoff.

The results are shown in Table 3. In column (1), we see that PBD increases at the cutoff by 57.17 (s.e. 3.10) days, reflecting the discontinuous structure of the UI schedule previously described. In column (3), we see that unemployment duration increases by 14.94 (s.e. 4.57) days in response to the higher PBD enjoyed when crossing the cutoff. When looking at the

effect on nonemployment duration, column (5), we see that there is an increase of 31.30 (s.e. 14.14) days. In terms of marginal effects, they correspond to an effect of PBD on unemployment duration of 0.26, and an effect of PBD on nonemployment duration of 0.55. In terms of elasticity, focusing on nonemployment duration which is the outcome that has received more attention in the literature as surveyed by [Schmieder and Von Wachter \(2016\)](#), I find a value of 0.58. This corresponds approximately to the middle value within the top quartile of the distribution of estimates reported in the survey. All of these together imply that providing the unemployed with more generous UI benefits induces large behavioral responses.

Columns (2), (4), and (6) investigate whether these behavioral responses vary when the unemployment rate increases. I do not find that these marginal effects are different from each other when the increase in generosity is implemented in boom relative to recession.⁴²

Now I turn to assessing how the exhaustion rate — the value of the survival function at the benefit exhaustion point — varies with the unemployment rate. I estimate it nonparametrically in the following way:

$$S_{P+1}^k = \frac{1}{N} \sum_{i=1}^N \mathbb{1}[D_i^k > P_i^k | k] \quad (14)$$

which captures the share of individuals with a nonemployment duration D^k longer than their potential benefit duration P^k , where k refers to different values of the regional unemployment rate. Panel (d) of Figure 3 depicts the results, where it is shown that the share of individuals that are not able to find a job before exhausting unemployment benefits increases with the unemployment rate, going from 0.29 to 0.40 when the unemployment rate changes from 8% to 26%, respectively.

Macroeconomic effect. The distortion induced by cycle-dependent UI benefit reforms documented above should be interpreted as a micro effect, since the design identifies labor supply responses for individuals with different benefits duration keeping labor market tightness constant. As pointed out by [Landais et al. \(2018a;b\)](#), when labor market tightness is not efficient, the welfare effect of UI reforms also needs to include a correction term to account for the fact that tightness may also respond to UI increases. When the correction term is countercyclical — as the authors argue — my finding can be interpreted as a lower bound, being possible that the overall cost of providing UI varies potentially even more with economic conditions than estimated here. However, when the micro and macro effects are equal, even if tightness is inefficient, UI changes do not shift tightness and the correction term vanishes. Recent meta-analysis evidence by [Cohen and Ganong \(2025\)](#) supports the later scenario, in which case my finding corresponds to an exact result and no correction term is needed.

⁴²The results are very similar when adding covariates as shown in Table A3.

5 Welfare Implications

In relation to the value provided by the unemployment insurance transfers, the empirical analysis above has shown that there are larger social benefits of increasing the potential duration of benefits in bad times relative to good times. Table 4 presents the estimates for the marginal benefit term, combining the findings on welfare weights and consumption smoothing. For the benchmark specification, with $\frac{\omega^R}{\omega^B} = 1.31$ and a risk aversion parameter $\gamma = 4$ (Landais and Spinnewijn, 2021), I find that the social benefits of transferring resources towards the unemployed in recession are 64% larger than for the unemployed in boom. Moreover, a main takeaway that arises from the sensitivity analysis in Table 4 is that, regardless of the implementation assumptions, the value provided by UI transfers is larger in recessions. This is true when focusing only on the consumption insurance value, but the magnitude is considerably larger when also accounting for the preferences for redistribution together with the shift in the composition of the unemployed along the effort dimension.

In relation to the cost, the estimates above imply that benefit extensions are less costly when economic conditions are bad. Using those estimates to calibrate the fiscal externality formula in equation (7), I obtain the results presented in Table 5. At the mean unemployment rate (15%), for every €1 transferred mechanically to the unemployed, the government needs to levy €0.87 on top of that because of the behavioral response. This efficiency cost is measured as euros of behavioral cost per euro of total mechanical transfer. Moreover, the fiscal externality is larger in good times, ranging from €1.02 in boom to €0.74 in recession. Overall, these estimates on the efficiency cost are consistent with the ones obtained by Schmieder et al. (2012), where they find that marginal effects remain constant over the cycle, with the only relevant component that changes with economic conditions being the exhaustion rate.

Lastly, I combine social benefits and costs to quantify the net welfare impact of changing potential benefit duration according to labor market conditions. To do so, I consider the effect of the budget-balanced reform described above such that $b_{P+1}^R > b_{P+1}^B$ as shown in Appendix B.3. Normalizing by unemployed's marginal utility in boom, I find that the net welfare impact of the reform is €0.78. That is, society would gain an extra €0.78 per euro transferred from individuals unemployed in boom to individuals unemployed in recession. Moreover, I decompose the welfare gain between the different components as shown in Figure 4. I find that they are all quantitatively important. Specifically, the welfare weights account for around 44% of the total gain, while the consumption smoothing component accounts for 37% and the efficiency cost channel for 19%. This implies that there are large welfare gains from having a system where the generosity of the transfers varies with economic conditions. Importantly, this

analysis highlights that the welfare gain not only increases in recession because of an efficiency cost decline as emphasized by the bulk of the empirical literature ([Kroft and Notowidigdo, 2016](#)), but also because the social benefits of the transfers increase considerably in bad times. The increase in social benefits is found when focusing only on the consumption insurance channel, but it becomes substantially more pronounced when accounting for preferences for redistribution and changes in the composition of the unemployed. Overall, this pushes for potential benefit duration being countercyclical, with a larger variation over the cycle than implied by previous work which documented that the social benefits do not vary with economic conditions.

Other policies. The approach adopted in the paper is conditional on the current tax and transfer system, and specifically, on other unemployment policies. In particular, the framework assesses the welfare gains of differentiating the UI policy taking as given the distribution of unemployed types. However, some countries like Germany, and unlike Spain, enforce job search requirement policies in order to monitor search effort, which may impact the distribution of unemployed types receiving benefits. It is worth noting that the proposed framework already accounts for current unemployment policies, so that in countries where monitoring is more prevalent and low-willingness-to-work types are less likely to receive UI, we would observe smaller variation in the composition of the unemployed along this dimension over the cycle, and thus this novel channel would account for a smaller share of the welfare effect. Nevertheless, these policies are costly to implement and even if put in place, the evidence indicates that there is imperfect compliance ([Arni and Schiprowski, 2019](#)). As a result, the framework is complementary to these policies.⁴³

Support for UI reform. Beyond accounting for social preferences to obtain a comprehensive assessment of the welfare effects of cycle-dependent UI policies, focusing on this dimension also provides information on the social acceptability of reforms. This is useful for policymakers considering implementation in democratic countries. I provide two pieces of suggestive evidence in this respect. First, within the online survey, I explore qualitatively whether there is hypothetical support for a UI reform of the type studied in this paper. Panel (d) of Figure 1 indicates that respondents state they would approve the proposed differentiation of the policy over the cycle. Second, I also leverage an alternative public survey with data on public opinions from Spain

⁴³The findings documented here on changes in the composition of the unemployed with labor market conditions are also relevant for the discussion of optimal benefit profiles over the unemployment spell. In the presence of dynamic selection in terms of search effort, the share of high-willingness-to-work individuals may also vary over the unemployment duration distribution. Evidence suggests this selection may be important (e.g., [Faberman and Kudlyak, 2019](#); [Lalive et al., 2024](#)). Therefore, my findings have important implications for the optimal profile. Although beyond the scope of this paper, future work could apply the proposed framework for the design of UI over the spell while keeping economic conditions fixed, exploring the role of dynamic selection in terms of effort as an alternative motive for differentiating benefit generosity between the short- and long-term unemployed.

containing views of around 38,000 individuals over the period 2005-2019. I focus on a question asking whether unemployment benefits should be same/more/less generous than in the given year. The results in Figure A7 indicate higher support for increasing benefit generosity in bad times. Although the setting does not allow to identify the drivers behind this demand for UI policy, the analysis can rule out factors such as respondent's own employment status or unemployment risk.⁴⁴

6 Conclusion

This paper provides a comprehensive assessment on whether the duration of the benefits should be higher when economic conditions are bad. I propose a simple and robust framework where the welfare effects from allowing the UI system to vary according to the state of the economy depend on the preferences for redistribution over effort types, the consumption smoothing gains, and the efficiency cost. I exploit a newly collected online survey, rich consumption data, administrative data on labor supply and time use data on job search to document four facts. First, society has a strong preference for transferring resources towards high-willingness-to-work individuals. Second, the pool of unemployed shifts towards high-willingness-to-work individuals in bad times. Third, individuals reduce their consumption more when hit by unemployment in recession. Fourth, the efficiency cost is large, and decreases in bad times.

Overall, I find that there are large welfare gains derived from having UI generosity varying with the unemployment rate. These gains are larger than previously found in the literature, highlighting the importance of accounting for the increasing social benefits of the transfers in recession. Moreover, these additional gains are not only due to the standard consumption insurance channel, but also come from the important role of society's preferences for redistribution along the willingness-to-work dimension together with shifts in the composition of the unemployed.

⁴⁴These results should be viewed as providing suggestive evidence on the public support for UI policy generosity. However, it is generally difficult to infer social preferences from the type of data described here, as pointed out in related important work such as Almås et al. (2020). In particular, individuals may hold different beliefs about the source of unemployment and the efficiency cost of providing benefits, which cannot be measured or controlled as in the main newly-collected online survey. See Appendix E for further details on results using the public opinion survey.

References

- ACOSTA, M., A. I. MUELLER, E. NAKAMURA AND J. STEINSSON, "Macroeconomic Effects of UI Extensions at Short and Long Durations," (2023).
- AIZER, A., H. HOYNES AND A. LLERAS-MUNYE, "Children and the US social safety net: Balancing disincentives for adults and benefits for children," *Journal of Economic Perspectives* 36 (2022), 149–74.
- AKERLOF, G. A., "The economics of "tagging" as applied to the optimal income tax, welfare programs, and manpower planning," *The American Economic Review* 68 (1978), 8–19.
- ALESINA, A. AND G.-M. ANGELETOS, "Fairness and redistribution," *American economic review* 95 (2005), 960–980.
- ALESINA, A. AND E. LA FERRARA, "Preferences for redistribution in the land of opportunities," *Journal of Public Economics* 89 (2005), 897–931.
- ALESINA, A., A. MIANO AND S. STANTCHEVA, "Immigration and redistribution," *The Review of Economic Studies* 90 (2023), 1–39.
- ALESINA, A., S. STANTCHEVA AND E. TESO, "Intergenerational mobility and preferences for redistribution," *American Economic Review* 108 (2018), 521–54.
- ALMÅS, I., A. W. CAPPELEN, E. Ø. SØRENSEN AND B. TUNGODDEN, "Fairness and the development of inequality acceptance," *Science* 328 (2010), 1176–1178.
- ALMÅS, I., A. W. CAPPELEN AND B. TUNGODDEN, "Cutthroat capitalism versus cuddly socialism: Are Americans more meritocratic and efficiency-seeking than Scandinavians?," *Journal of Political Economy* 128 (2020), 1753–1788.
- ALMUNIA, M., P. ANTRÀS, D. LOPEZ-RODRIGUEZ AND E. MORALES, "Venting out: Exports during a domestic slump," *American Economic Review* 111 (2021), 3611–3662.
- ANDREWS, I. AND C. MILLER, "Optimal social insurance with heterogeneity," *Unpublished manuscript* 26 (2013).
- ARNI, P. AND A. SCHIPROWSKI, "Job search requirements, effort provision and labor market outcomes," *Journal of Public Economics* 169 (2019), 65–88.
- AUTOR, D., A. KOSTØL, M. MOGSTAD AND B. SETZLER, "Disability benefits, consumption insurance, and household labor supply," *American Economic Review* 109 (2019), 2613–2654.
- BAILY, M. N., "Some aspects of optimal unemployment insurance," *Journal of Public Economics* 10 (1978), 379–402.
- BLUNDELL, R., L. PISTAFERRI AND I. PRESTON, "Consumption inequality and partial insurance," *American Economic Review* 98 (2008), 1887–1921.
- BOONE, C., A. DUBE, L. GOODMAN AND E. KAPLAN, "Unemployment insurance generosity and aggregate employment," *American Economic Journal: Economic Policy* 13 (2021), 58–99.
- BRAUN, C., "Measuring the Total Number of US Job Seekers," (2022).
- BROWNING, M. AND T. F. CROSSLEY, "Unemployment insurance benefit levels and consumption changes," *Journal of public Economics* 80 (2001), 1–23.
- CAMPOS, R. G., J. I. GARCÍA-PÉREZ AND I. REGGIO, "Moral Hazard Versus Liquidity and the Optimal Timing of Unemployment Benefits," *The Economic Journal* 132 (05 2022), 2674–2701.
- CAMPOS, R. G. AND I. REGGIO, "Consumption in the shadow of unemployment," *European Economic Review* 78 (2015), 39–54.
- , "Do the Unemployed Pay Lower Prices? A Reassessment of the Value of Unemployment Insurance," *Journal of the European Economic Association* 18 (10 2019), 2135–2181.
- CAPOZZA, F. AND K. SRINIVASAN, "Who should get money? estimating welfare weights in the us," *URPP Equality of Opportunity Discussion Paper Series* (2024).
- CAPPELEN, A. W., A. D. HOLE, E. Ø. SØRENSEN AND B. TUNGODDEN, "The Pluralism of Fairness Ideals: An Experimental Approach," *American Economic Review* 97 (2007), 818–827.

- CAPPELEN, A. W., J. KONOW, E. Ø. SØRENSEN AND B. TUNGODDEN, "Just Luck: An Experimental Study of Risk-Taking and Fairness," *American Economic Review* 103 (2013), 1398–1413.
- CARD, D., R. CHETTY AND A. WEBER, "Cash-on-hand and competing models of intertemporal behavior: New evidence from the labor market," *The Quarterly Journal of Economics* 122 (2007), 1511–1560.
- CARD, D., A. JOHNSTON, P. LEUNG, A. MAS AND Z. PEI, "The effect of unemployment benefits on the duration of unemployment insurance receipt: New evidence from a regression kink design in Missouri, 2003–2013," *American Economic Review* 105 (2015), 126–30.
- CARD, D. AND P. B. LEVINE, "Extended benefits and the duration of UI spells: evidence from the New Jersey extended benefit program," *Journal of Public Economics* 78 (2000), 107–138.
- CHETTY, R., "A general formula for the optimal level of social insurance," *Journal of Public Economics* 90 (2006), 1879–1901.
- , "Moral hazard versus liquidity and optimal unemployment insurance," *Journal of Political Economy* 116 (2008), 173–234.
- CHETTY, R., J. N. FRIEDMAN, M. STEPNER ET AL., "The economic impacts of COVID-19: Evidence from a new public database built using private sector data," Technical Report, national Bureau of economic research, 2020.
- CHODOROW-REICH, G., J. COGLIANESE AND L. KARABARBOUNIS, "The macro effects of unemployment benefit extensions: a measurement error approach," *The Quarterly Journal of Economics* 134 (2019), 227–279.
- COHEN, J. P. AND P. GANONG, "Disemployment Effects of Unemployment Insurance: A Meta-Analysis," *American Economic Review: Insights* Forthcoming (2025).
- DIETERLE, S., O. BARTALOTTI AND Q. BRUMMET, "Revisiting the Effects of Unemployment Insurance Extensions on Unemployment: A Measurement-Error-Corrected Regression Discontinuity Approach," *American Economic Journal: Economic Policy* 12 (May 2020), 84–114.
- DOMENECH-ARUMI, G. AND S. VANNUTELLI, "Bringing Them In or Pushing Them Out? The Labor Market Effects of Pro-Cyclical Unemployment Assistance Changes," *The Review of Economics and Statistics* (2023), 1–44.
- DURANTE, R., L. PUTTERMAN AND J. VAN DER WEELE, "Preferences for Redistribution and Perception of Fairness: An Experimental Study," *Journal of the European Economic Association* 12 (08 2014), 1059–1086.
- FABERMAN, R. J. AND M. KUDLYAK, "The intensity of job search and search duration," *American Economic Journal: Macroeconomics* 11 (2019), 327–357.
- FABERMAN, R. J., A. I. MUELLER, A. ŞAHİN AND G. TOPA, "Job search behavior among the employed and non-employed," *Econometrica* 90 (2022), 1743–1779.
- FARBER, H. S., J. ROTHSTEIN AND R. G. VALLETTA, "The effect of extended unemployment insurance benefits: Evidence from the 2012–2013 phase-out," *American Economic Review* 105 (2015), 171–176.
- FEREY, A., "Redistribution and Unemployment Insurance," (2022).
- GANONG, P., F. E. GREIG, P. J. NOEL, D. M. SULLIVAN AND J. S. VAVRA, "Spending and Job-Finding Impacts of Expanded Unemployment Benefits: Evidence from Administrative Micro Data," Technical Report, National Bureau of Economic Research, 2022.
- GANONG, P., D. JONES, P. J. NOEL, F. E. GREIG, D. FARRELL AND C. WHEAT, "Wealth, race, and consumption smoothing of typical income shocks," Technical Report, National Bureau of Economic Research, 2020.
- GANONG, P. AND P. NOEL, "Consumer spending during unemployment: Positive and normative implications," *American Economic Review* 109 (2019), 2383–2424.
- GERARD, F. AND G. GONZAGA, "Informal labor and the efficiency cost of social programs: Evidence from unemployment insurance in brazil," *American Economic Journal: Economic Policy* 13 (2021), 167–206.

- GERARD, F. AND J. NARITOMI, "Job displacement insurance and (the lack of) consumption-smoothing," *American Economic Review* 111 (2021), 899–942.
- GROSS, T., M. J. NOTOWIDIGDO AND J. WANG, "The marginal propensity to consume over the business cycle," *American Economic Journal: Macroeconomics* 12 (2020), 351–384.
- GRUBER, J., "The Consumption Smoothing Benefits of Unemployment Insurance," *The American Economic Review* 87 (1997), 192–205.
- HAGEDORN, M., F. KARAHAN, I. MANOVSKII AND K. MITMAN, "Unemployment benefits and unemployment in the great recession: the role of macro effects," Technical Report, 2019.
- HEATHCOTE, J., F. PERRI AND G. L. VIOLENTE, "Unequal we stand: An empirical analysis of economic inequality in the United States, 1967–2006," *Review of Economic dynamics* 13 (2010), 15–51.
- HENDREN, N., "Knowledge of future job loss and implications for unemployment insurance," *American Economic Review* 107 (2017), 1778–1823.
- HERNANDEZ MARTINEZ, V. AND K. LIU, "The value of unemployment insurance: Liquidity vs. insurance value," *Labour Economics* 93 (2025), 102691.
- INE, "Encuesta de Presupuestos Familiares. Base 2006. Principales Características," Spanish National Statistics Institute, Prices and Family Budget Division (2008).
- KATZ, L. F. AND B. D. MEYER, "The impact of the potential duration of unemployment benefits on the duration of unemployment," *Journal of public economics* 41 (1990), 45–72.
- KEKRE, R., "Unemployment insurance in macroeconomic stabilization," *Review of Economic Studies* (2023), forthcoming.
- KHOURY, L., "Choosing Unemployment Benefits: the Role of Adverse Selection and Moral Hazard," (2021).
- KOLSRUD, J., C. LANDAIS, P. NILSSON AND J. SPINNEWIJN, "The optimal timing of unemployment benefits: Theory and evidence from sweden," *American Economic Review* 108 (2018), 985–1033.
- KOLSRUD, J., C. LANDAIS, D. RECK AND J. SPINNEWIJN, "Retirement consumption and pension design," *American Economic Review* 114 (2024), 89–133.
- KROFT, K., F. LANGE, M. J. NOTOWIDIGDO AND L. F. KATZ, "Long-term unemployment and the Great Recession: the role of composition, duration dependence, and nonparticipation," *Journal of Labor Economics* 34 (2016), S7–S54.
- KROFT, K. AND M. J. NOTOWIDIGDO, "Should unemployment insurance vary with the unemployment rate? Theory and evidence," *The Review of Economic Studies* 83 (2016), 1092–1124.
- KROSNICK, J. A. AND D. F. ALWIN, "Aging and susceptibility to attitude change," *Journal of personality and social psychology* 57 (1989), 416.
- KRUEGER, A. B. AND B. D. MEYER, "Labor supply effects of social insurance," *Handbook of Public Economics* 4 (2002), 2327–2392.
- LALIVE, R., C. LANDAIS AND J. ZWEIMÜLLER, "Market Externalities of Large Unemployment Insurance Extension Programs," *The American Economic Review* 105 (2015), 3564–3596.
- LALIVE, R., A. OSIKOMINU, L. PESARESI, J. ZUCHUAT AND J. ZWEIMÜLLER, "Duration Dependence in Finding a Job: Applications, Interviews, and Job Offers," Working paper, September 2024.
- LANDAIS, C., "Assessing the welfare effects of unemployment benefits using the regression kink design," *American Economic Journal: Economic Policy* 7 (2015), 243–78.
- LANDAIS, C., P. MICHAILLAT AND E. SAEZ, "A macroeconomic approach to optimal unemployment insurance: Applications," *American Economic Journal: Economic Policy* 10 (2018a), 182–216.
- , "A macroeconomic approach to optimal unemployment insurance: Theory," *American Economic Journal: Economic Policy* 10 (2018b), 152–81.
- LANDAIS, C. AND J. SPINNEWIJN, "The value of unemployment insurance," *The Review of Economic Studies* 88 (2021), 3041–3085.
- LE BARBANCHON, T., "The effect of the potential duration of unemployment benefits on unemployment exits to work and match quality in France," *Labour Economics* 42 (2016), 16–29.

- LE BARBANCHON, T., J. SCHMIEDER AND A. WEBER, "Job search, unemployment insurance, and active labor market policies," in *Handbook of Labor Economics* volume 5 (Elsevier, 2024), 435–580.
- LENTZ, R. AND T. TRANAES, "Job search and savings: Wealth effects and duration dependence," *Journal of labor Economics* 23 (2005), 467–489.
- LICHTER, A. AND A. SCHIPROWSKI, "Benefit duration, job search behavior and re-employment," *Journal of Public Economics* 193 (2021), 104326.
- LINDNER, A. AND B. REIZER, "Frontloading the unemployment benefit: An empirical assessment," *American Economic Journal: Applied Economics* Forthcoming (2019).
- LOW, H. AND L. PISTAFERRI, "Disability insurance and the dynamics of the incentive insurance trade-off," *American Economic Review* 105 (2015), 2986–3029.
- MARINESCU, I., D. SKANDALIS AND D. ZHAO, "The impact of the Federal Pandemic Unemployment Compensation on job search and vacancy creation," *Journal of Public Economics* 200 (2021), 104471.
- MARTÍNEZ-TOLEDANO, C., "House price cycles, wealth inequality and portfolio reshuffling," *WID World Working Paper* 2 (2020).
- McCRARY, J., "Manipulation of the running variable in the regression discontinuity design: A density test," *Journal of Econometrics* 142 (2008), 698–714.
- McKAY, A. AND R. REIS, "Optimal automatic stabilizers," *The Review of Economic Studies* 88 (2021), 2375–2406.
- MITMAN, K. AND S. RABINOVICH, "Optimal unemployment insurance in an equilibrium business-cycle model," *Journal of Monetary Economics* 71 (2015), 99–118.
- MUELLER, A. I. AND J. SPINNEWIJN, "The nature of long-term unemployment: Predictability, heterogeneity and selection," Technical Report, National Bureau of Economic Research, 2023.
- MUKOYAMA, T., C. PATTERSON AND A. SAHIN, "Job search behavior over the business cycle," *American Economic Journal: Macroeconomics* 10 (2018), 190–215.
- ROEMER, J. E., "Equality of Opportunity," (1998).
- ROEMER, J. E., R. AABERGE, U. COLOMBINO, J. FRITZELL, S. P. JENKINS, A. LEFRANC, I. MARX, M. PAGE, E. POMMER, J. RUIZ-CASTILLO ET AL., "To what extent do fiscal regimes equalize opportunities for income acquisition among citizens?," *Journal of Public Economics* 87 (2003), 539–565.
- ROTHSTEIN, J., "Unemployment insurance and job search in the Great Recession," National Bureau of Economic Research (2011).
- SAEZ, E. AND S. STANTCHEVA, "Generalized social marginal welfare weights for optimal tax theory," *American Economic Review* 106 (2016), 24–45.
- SCHMIEDER, J. F. AND T. VON WACHTER, "The effects of unemployment insurance benefits: New evidence and interpretation," *Annual Review of Economics* 8 (2016), 547–581.
- SCHMIEDER, J. F., T. VON WACHTER AND S. BENDER, "The effects of extended unemployment insurance over the business cycle: Evidence from regression discontinuity estimates over 20 years," *The Quarterly Journal of Economics* 127 (2012), 701–752.
- SHIMER, R. AND I. WERNING, "Liquidity and Insurance for the Unemployed," *American Economic Review* 98 (2008), 1922–42.
- STANTCHEVA, S., "How to run surveys: A guide to creating your own identifying variation and revealing the invisible," *Annual Review of Economics* 15 (2023), 205–234.
- STEPHENS JR, M., "The long-run consumption effects of earnings shocks," *Review of Economics and Statistics* 83 (2001), 28–36.
- SUMMERS, L., "The Economic Case for Extending Unemployment Insurance," <https://obamawhitehouse.archives.gov/blog/2010/07/14/economic-case-extending-unemployment-insurance> (2010), accessed: 2023-15-09.
- WUNSCH, C. AND V. ZABRODINA, "Unemployment Insurance with Policy Differentiation," (2024).

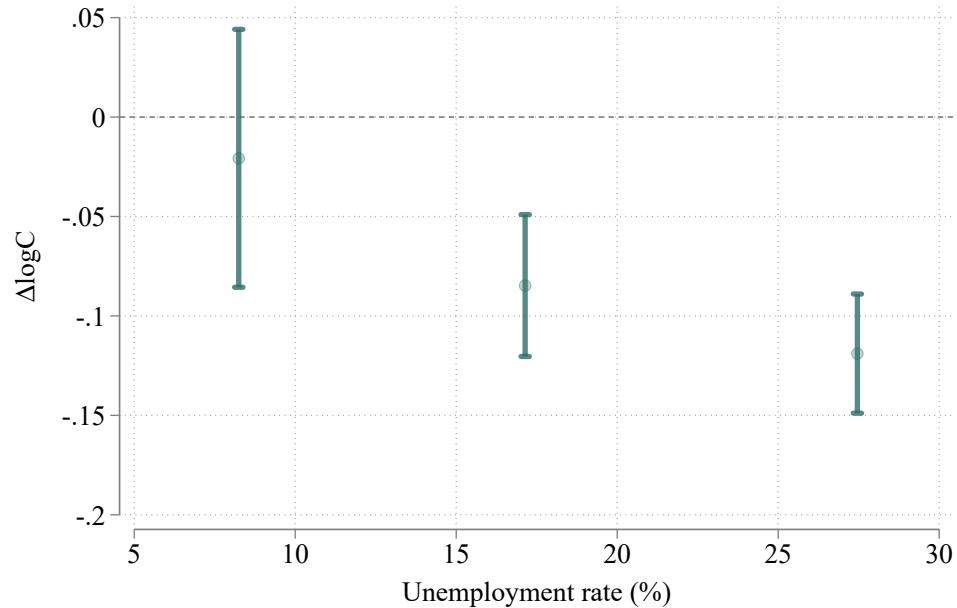
Figure 1: Redistribution Over Search Effort Types



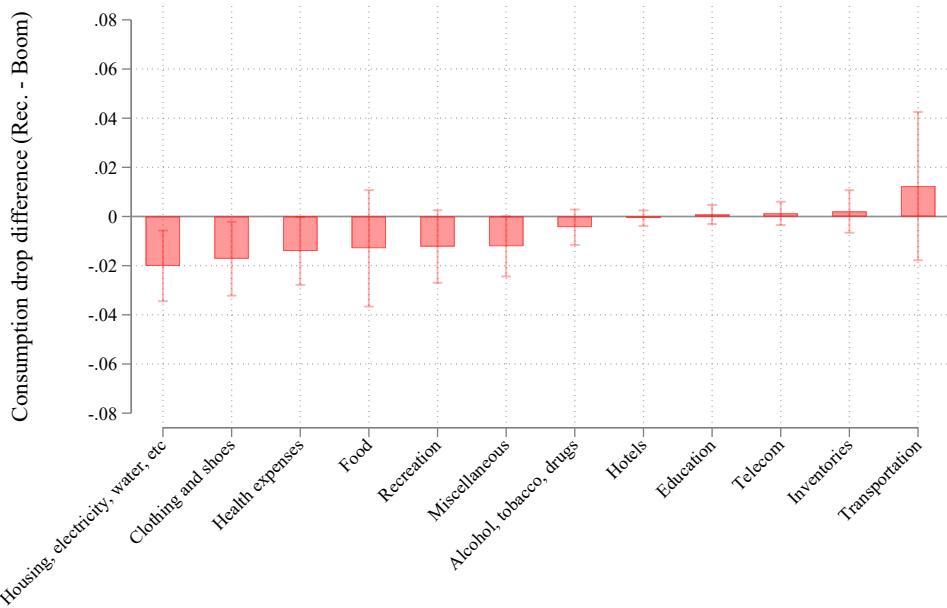
Note: The graphs in Panels (a)-(d) present results on preferences for redistribution from the online survey, while Panel (e) presents results from Time Use data on search effort changes among the unemployed. In particular, Panel (a) depicts the share of respondents choosing a given option when presented with the question on qualitative preferences for redistribution: *Imagine there are 2 unemployed individuals, A and B, who receive €950 while unemployed and are entitled to receive benefits for up to 14 months if remaining unemployed: A looked for jobs last week; B did not look for jobs last week. The government wants to transfer €1000 to individuals A and B in a one-time payment, and is thinking of how to allocate them. Please choose what allocation option you would prefer: More money to A than to B; More money to B than to A; Same amount to A and B.* Panel (b) depicts the share of respondents accepting an unequal allocation when presented with the question on quantitative preferences for redistribution: *Imagine there are 2 unemployed individuals, A and B, who receive €950 while unemployed and are entitled to receive benefits for up to 14 months if remaining unemployed: A looked for jobs last week; B did not look for jobs last week. The government wants to transfer €1000 to individuals A and B in a one-time payment, and is thinking of how to allocate them. Now imagine that an unequal allocation may be costly. That is, it can allocate €500 each, or more to one than the other, but the latter option may result in the total amount of resources that can be distributed being reduced. Please choose what allocation option you would prefer: 500 for A and 500 for B; 550 for A and 400 for B.* The offered amounts are experimentally varied as explained in Section 4.1.1, so that the implied marginal rate of transformation (MRT) or cost of the transfer varies depending on the amounts. Panel (c) depicts a wordcloud with the most common words used by respondents to describe their reasons for choosing the option in the question for Panel (a). Panel (d) shows the share of individuals stating that they would support a cycle-dependent benefit duration reform. The exact question is: *There exists the idea that benefits received by each unemployed could be more generous (higher benefit level or duration) at times when economic conditions are bad (high unemployment rate), relative to times when economic conditions are good (low unemployment rate). Some reasons for that are that when economic conditions are bad, the unemployed suffer larger consumption reductions upon job loss, and the type of unemployed at that moment are, on average, individuals who put more effort into job finding but who face more difficulties given the lack of job offers. Would you agree with having unemployment benefits changing with economic conditions in this way?* Panel (e) shows how search effort by the unemployed varies with economic conditions. It is built using the 2002-2003 and 2009-2010 waves of the Spanish Time Use data, and unemployment rate from the LFS. First, data on the probability of daily search is collapsed at the region level. Second, it is converted to weekly terms following Faberman et al. (2022). Third, it is residualized on region FEs and weighted by population. More details on the methodology are presented in Appendix D.

Figure 2: Consumption Smoothing Gains

(a) Consumption Drop Upon Job Loss



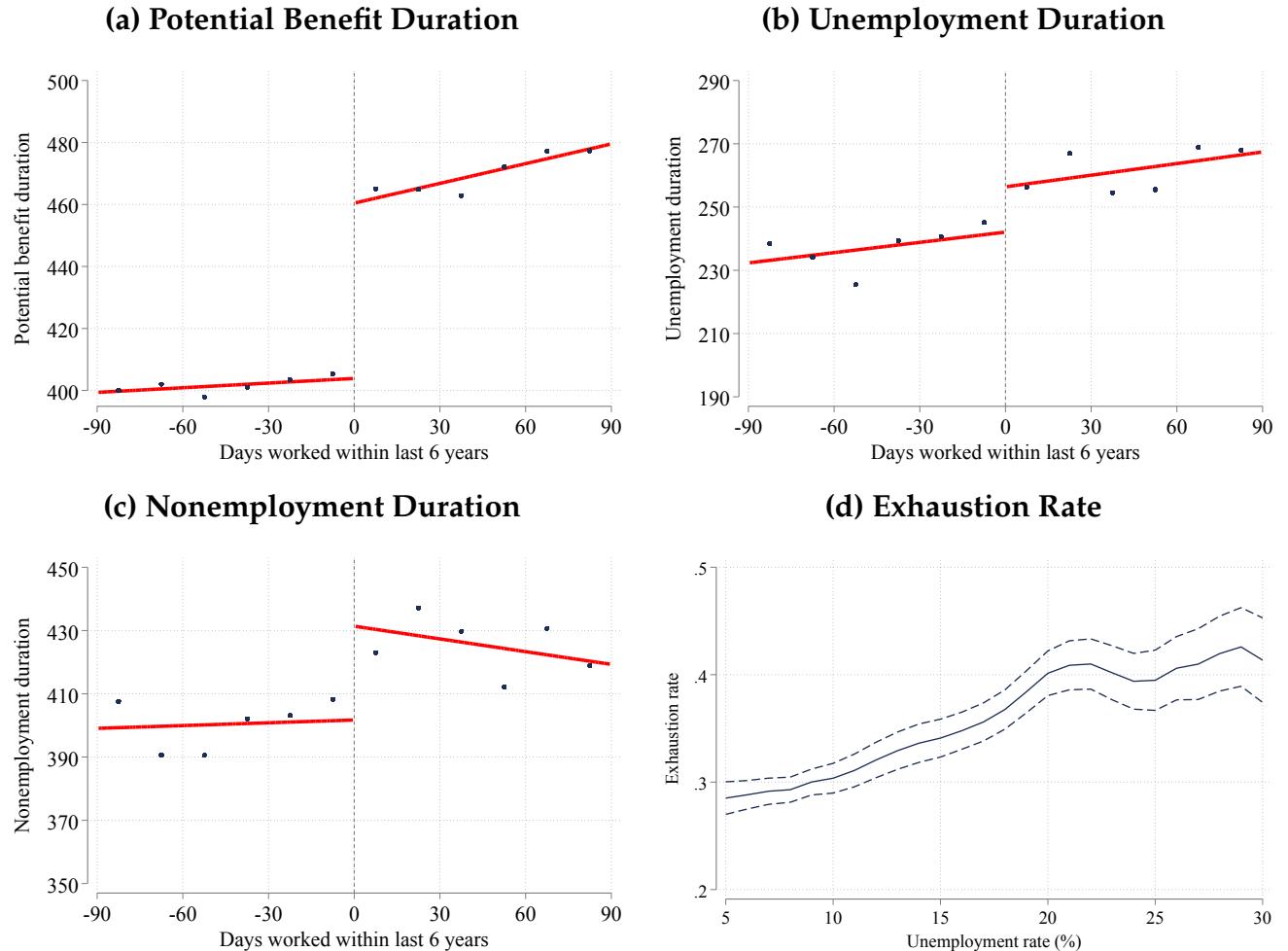
(b) Evolution of Consumption Drop Over the Cycle by Category



Note: Panel (a) shows how the within-individual consumption drop upon job loss varies with the unemployment rate. Specifically, the graph plots the α_g coefficients obtained by estimating the following regression equation: $\log C_{it} = \sum_j \alpha_j \cdot \mathbb{1}[Unemployed_{it}] \cdot \mathbb{1}[g(r(i,t)) = j] + \lambda_i + \lambda_{r(i,t)} + \lambda_t + X'\beta + \varepsilon_{it}$, where $\log C_{it}$ refers to log consumption measured at the household level, $\mathbb{1}[Unemployed_{it}]$ is a dummy variable that equals one when the household head is unemployed, $\mathbb{1}[g(r(i,t)) = j]$ is a dummy variable that equals one when the unemployment rate of the region where the household head lives falls within unemployment rate group j , and $\lambda_i, \lambda_{r(i,t)}, \lambda_t$ are individual, region and year fixed effects, respectively. The vector of controls X includes dummies for the regional unemployment rate groups, and information on type of household and other household composition variables, intended to control for any mechanical relationship between household composition and economic conditions or job loss. The three unemployment rate groups approximate the national average in boom, normal times and recession. 95% confidence intervals from standard errors clustered at the region-year level.

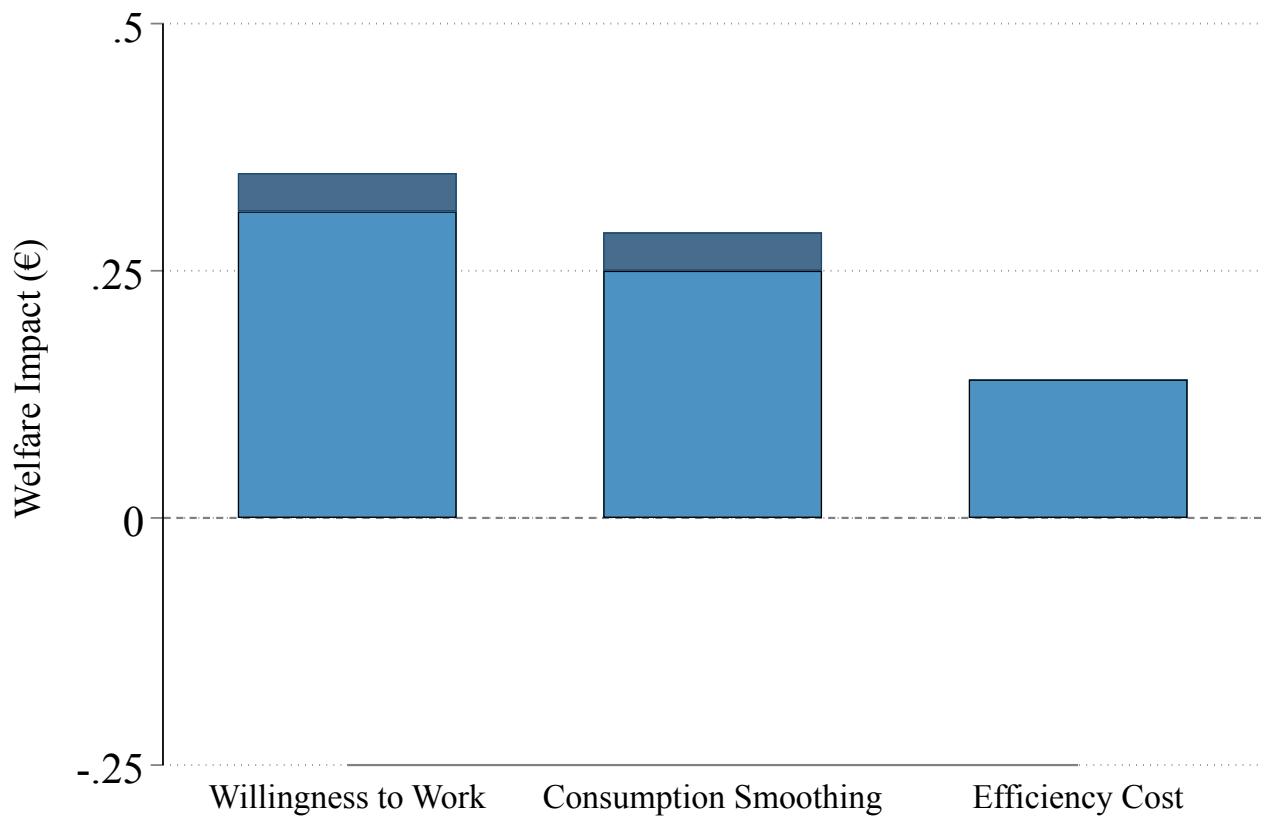
Panel (b) shows how the magnitude of the category-specific change in consumption upon unemployment varies with economic conditions. Specifically, I first estimate models of the following form: $Y_{it}^j = \beta_0^j + \beta_1^j Unemployed_{it} + \beta_2^j Unemployed_{it} \times U.Rate_{r(i,t)t} + \lambda_i + \lambda_{r(i,t)} + \lambda_t + X'\beta + \varepsilon_{it}$, where $Y_{it}^j = C_{it}^j / \sum_j C_{it}^j$ refers to the share of each consumption category j relative to overall consumption of the individual in the first year observed in the sample, which is denoted as her cohort $h(i)$. Other variables as well as confidence intervals are the same as the ones defined for Panel (a). For each category, I compute the difference between the change in recession and the change in boom as $\beta_2^j \times (U.Rate^R - U.Rate^B)$. Adding up all the estimates by category yields the total change in the consumption drop.

Figure 3: UI Generosity and Labor Market Outcomes



Note: Panels (a), (b), and (c) are binned scatter plots of PBD, unemployment and nonemployment duration, respectively, versus work experience within last 6 years, measured in days. They are depicted in days relative to the closest cutoff, effectively pooling together all cutoffs shown in Figure A5. Nonemployment duration is capped at 3 years. Panel (d) shows how the exhaustion rate — the share of individuals remaining nonemployed beyond the maximum entitled time with paid transfers — evolves with economic conditions. It is estimated nonparametrically as described in Section 4.3.

Figure 4: Welfare Impact



Note: The graph shows the contribution of the different components — welfare weights, consumption smoothing and efficiency cost — to the net welfare gain of implementing a budget-balanced cycle-dependent benefit duration reform. The contribution of each component refers to the change in the welfare gain when that component changes from no variation over the cycle to the variation estimated in the main text. It uses the estimates in the main text of the implementation equations (6) and (7), and follows the derivation in Appendix B.3. The darker areas correspond to an interaction effect between the ratio of welfare weights and the consumption smoothing component.

Table 1: Consumption Changes Upon Job Loss

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A: Estimates</i>						
Unemployed	-0.096 (0.013)	-0.006 (0.032)	0.003 (0.035)	-0.095 (0.013)	-0.011 (0.031)	-0.001 (0.034)
Unemployed \times Unemp. rate (%)		-0.0041 (0.0013)	-0.0045 (0.0015)		-0.0040 (0.0012)	-0.0044 (0.0014)
Region FE	Yes	Yes	No	No	Yes	No
Year FE	Yes	Yes	No	Yes	Yes	No
Region \times Year FEs	No	No	Yes	No	No	Yes
Controls	No	No	No	Yes	Yes	Yes
N	63304	63304	63304	63304	63304	63304
<i>Panel B: Post-estimation</i>						
$\frac{\Delta ue,B}{c}$ (Boom: Unemp. rate 8%)		-0.039 (0.022)	-0.033 (0.024)		-0.042 (0.023)	-0.036 (0.025)
$\frac{\Delta ue,R}{c}$ (Recession: Unemp. rate 26%)		-0.112 (0.011)	-0.113 (0.012)		-0.113 (0.013)	-0.115 (0.014)
<i>Panel C: Statistics</i>						
$\frac{\Delta ue,R}{c} - \frac{\Delta ue,B}{c}$ (Difference: Recession - Boom)		-0.074 (0.023)	-0.080 (0.026)		-0.071 (0.021)	-0.079 (0.025)

Note: The table shows how the consumption change upon unemployment evolves over the business cycle. Results are obtained from a regression with specification as in equation (10). Columns (1)-(3) include controls for regional unemployment rate and type of household. Columns (4)-(6) include controls for regional unemployment rate, type of household and the following set of covariates: age, sex, education, civil status, (log) number of individuals in household, number of household members working, number of household members unemployed, number of kids, rural status and house ownership. Standard errors are clustered at the region-year level and reported in parentheses.

Table 2: First-Year Consumption

	(1)	(2)	(3)	(4)	(5)	(6)
Unemployed (t+1)	-0.253 (0.0186)	-0.252 (0.0455)	-0.255 (0.0459)	-0.163 (0.0171)	-0.154 (0.0431)	-0.157 (0.0437)
Unemployed (t+1) \times Unemp. rate (%)		-0.00005 (0.00239)	0.00020 (0.00241)		-0.00045 (0.00226)	-0.00025 (0.00229)
Region FE	Yes	Yes	No	No	Yes	No
Year FE	Yes	Yes	No	Yes	Yes	No
Region \times Year FEs	No	No	Yes	No	No	Yes
Controls	No	No	No	Yes	Yes	Yes
N	31652	31652	31652	31652	31652	31652

Note: The table shows how consumption evolves over the business cycle during the first year individuals are observed in the sample. Specifically, it compares first-year (t) consumption patterns (while employed) for individuals that get unemployed in the following period (t+1) relative to those that remain employed. Results are obtained from a regression specification as in equation (12). Since here I only look at individuals' first year in the sample, these specifications do not include individual FEs. Columns (1)-(3) include controls for type of household. Columns (4)-(6) include controls for type of household and the following set of covariates: age, sex, education, civil status, (log) number of individuals in household, number of household members working, number of household members unemployed, number of kids, rural status and house ownership. Standard errors are clustered at the region-year level and reported in parentheses.

Table 3: Marginal Cost

	Pot. benefit duration		Unemp. duration		Nonemp. duration	
	(1)	(2)	(3)	(4)	(5)	(6)
$\mathbb{1}[Exp. > 0]$	57.17 (3.10)	56.13 (4.01)	14.94 (4.57)	15.98 (7.99)	31.30 (14.14)	41.75 (18.40)
$\mathbb{1}[Exp. > 0] \times$ Unemp. rate (%)		0.08 (0.26)		-0.07 (0.37)		-0.75 (0.84)
Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
N	13994	13994	13994	13994	13994	13994

Note: The table shows the marginal effect on potential benefit duration, unemployment duration and nonemployment duration. It also explores whether these relationships vary with regional unemployment rate. They are estimated following equation (13). Standard errors are clustered at the region level and reported in parentheses.

Table 4: Marginal Benefit Calibration

	$\gamma = 1$	$\gamma = 2$	$\gamma = 3$	$\gamma = 4$	$\gamma = 5$
$\frac{\omega^R}{\omega^B} = 1$	1.07	1.14	1.20	1.25	1.31
$\frac{\omega^R}{\omega^B} = 1.13$	1.21	1.28	1.35	1.42	1.48
$\frac{\omega^R}{\omega^B} = 1.15$	1.23	1.31	1.38	1.44	1.50
$\frac{\omega^R}{\omega^B} = 1.31$	1.40	1.49	1.57	1.64	1.71
$\frac{\omega^R}{\omega^B} = 1.5$	1.61	1.70	1.79	1.88	1.96

Note: The table combines results on consumption smoothing gains and welfare weights estimated in previous sections to produce estimates of the marginal benefit term $\frac{E_{P+1}^{u,R}[\omega(\bar{e}_i)u'(c_{i,P+1}^u)]}{E_{P+1}^{u,B}[\omega(\bar{e}_i)u'(c_{i,P+1}^u)]}$, under different implementation assumptions following the consumption-based approach in equation (6). The rows show results under different ratios of welfare weights, where I use the benchmark estimate for relative valuation across types obtained in Section 4.1.1, and vary the magnitude of search effort change over the business cycle that is due to a composition effect. Row (1) refers to the case where there is no composition change. Row (2) refers to the case where only composition changes due to observables as measured by the set of demographics in the Spanish Time Use data and LFS, as obtained from the prediction exercise in Appendix D. Row (3) refers to half of the composition change found by (Mukoyama et al., 2018) in the US using CPS data, while row (4) refers to the same composition change found by them. Row (5) refers to the case where all the change in effort is assumed to be due to composition effects. Columns (1)-(5) explore sensitivity of the results with respect to the parameter of relative risk aversion γ .

Table 5: Marginal Cost Calibration

	$\frac{dD_b}{db_{P+1}}$	$\frac{dD}{db_{P+1}}$	b	τ	S_{P+1}	FE
Boom (8% unemp. rate)	0.009	0.019	850	53	0.29	1.02
Mean (15% unemp. rate)	0.009	0.019	850	53	0.34	0.87
Recession (26% unemp. rate)	0.009	0.019	850	53	0.40	0.74

Note: The table quantifies how the efficiency cost varies with labor market conditions. It shows the estimates for the different components in equation (7), and how they change when the economy goes from boom to recession, with the magnitudes reflecting the national unemployment rate at different points of the business cycle. Effects of a €1 equivalent increase in potential benefit duration on unemployment duration $\frac{dD_b}{db_{P+1}}$ and nonemployment duration $\frac{dD}{db_{P+1}}$ are measured in days. Average monthly benefit level is $b = 850$, and the payroll tax is $\tau = 53$. The tax is obtained as the amount consistent with the stated benefit level and the ratio of UI recipients to employed individuals over the period 2007-2017, following Landais (2015). Number of UI recipients is obtained from OECD, and number of employed from EPA (INE).

Online Appendix

Unemployment Insurance, Inequality of Opportunity, and Labor Market Conditions

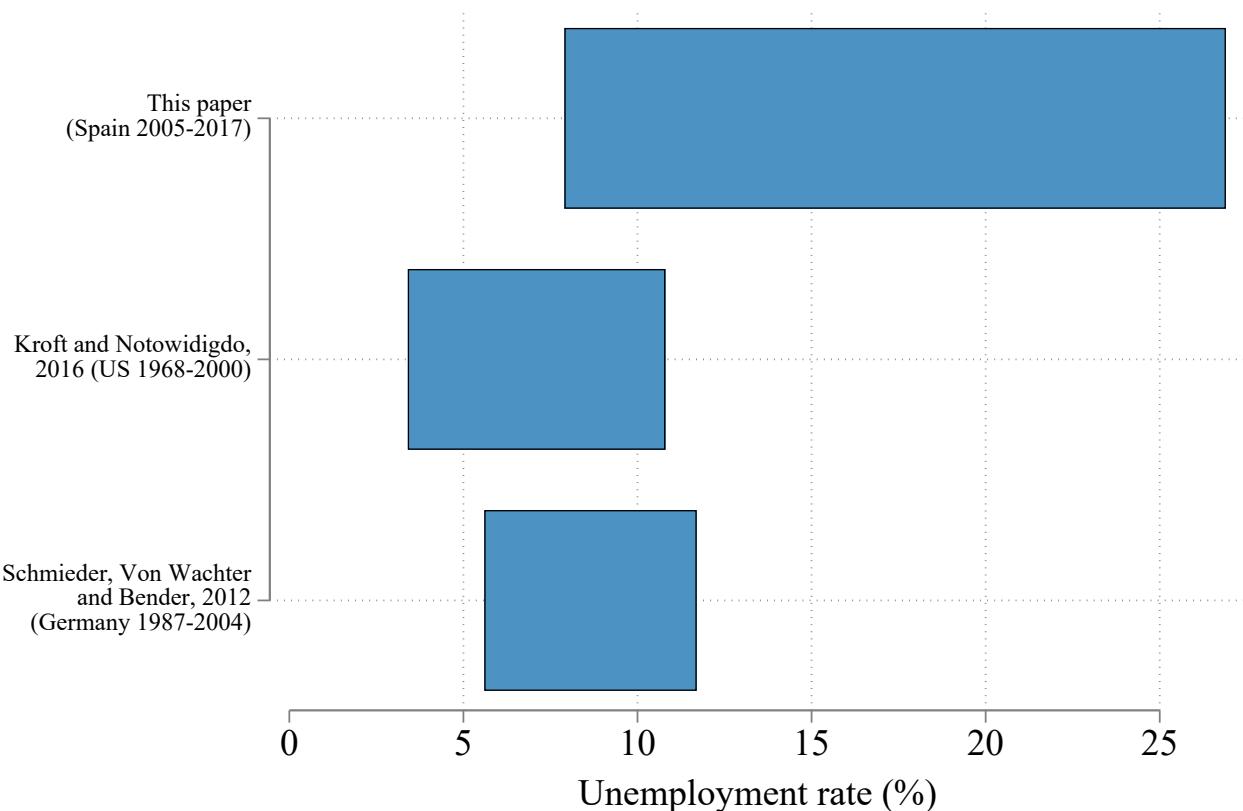
Jon Piqueras
Bocconi University

Contents

A Additional Figures and Tables	46
B Derivations	56
B.1 Model	56
B.2 Implementation Assumptions	59
B.3 Welfare Impact	59
C Online Survey	61
D Time Use Data	69
E Public Opinion Polls	71

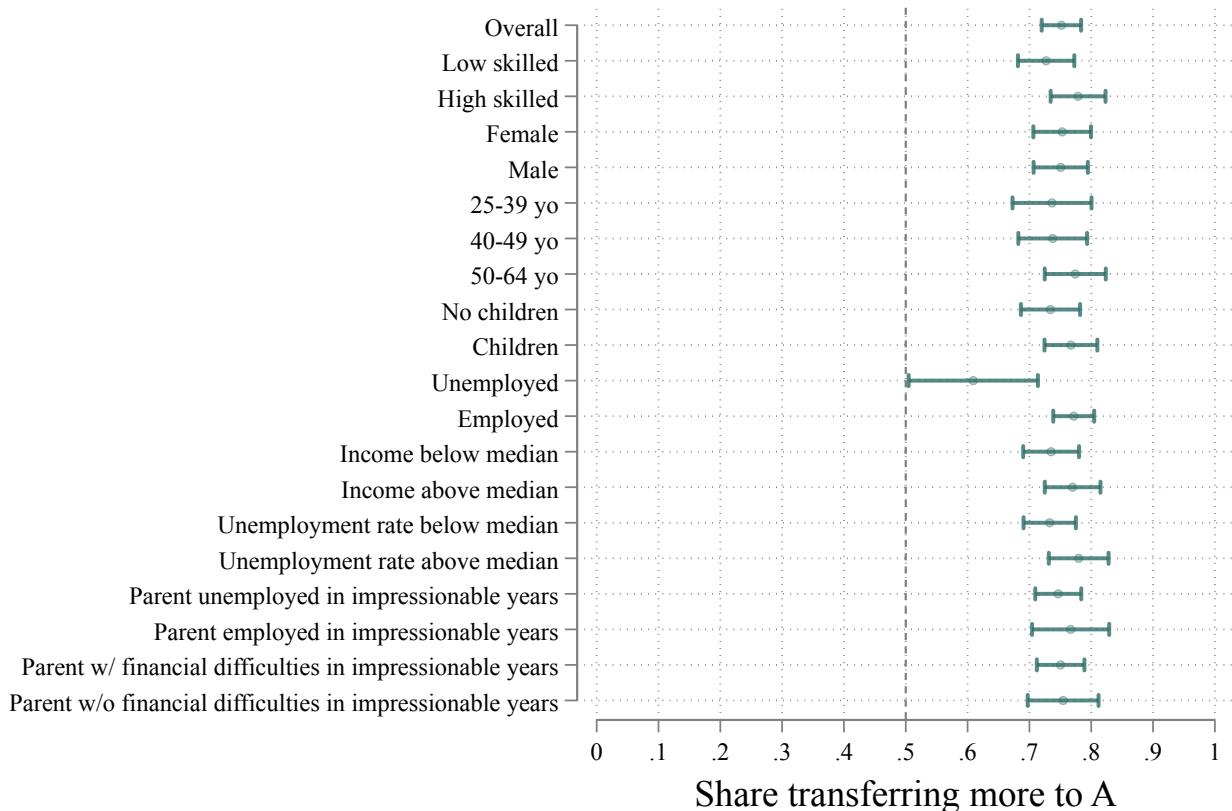
Appendix A Additional Figures and Tables

Figure A1: Spanish Unemployment Fluctuations in the Context of Recent Literature



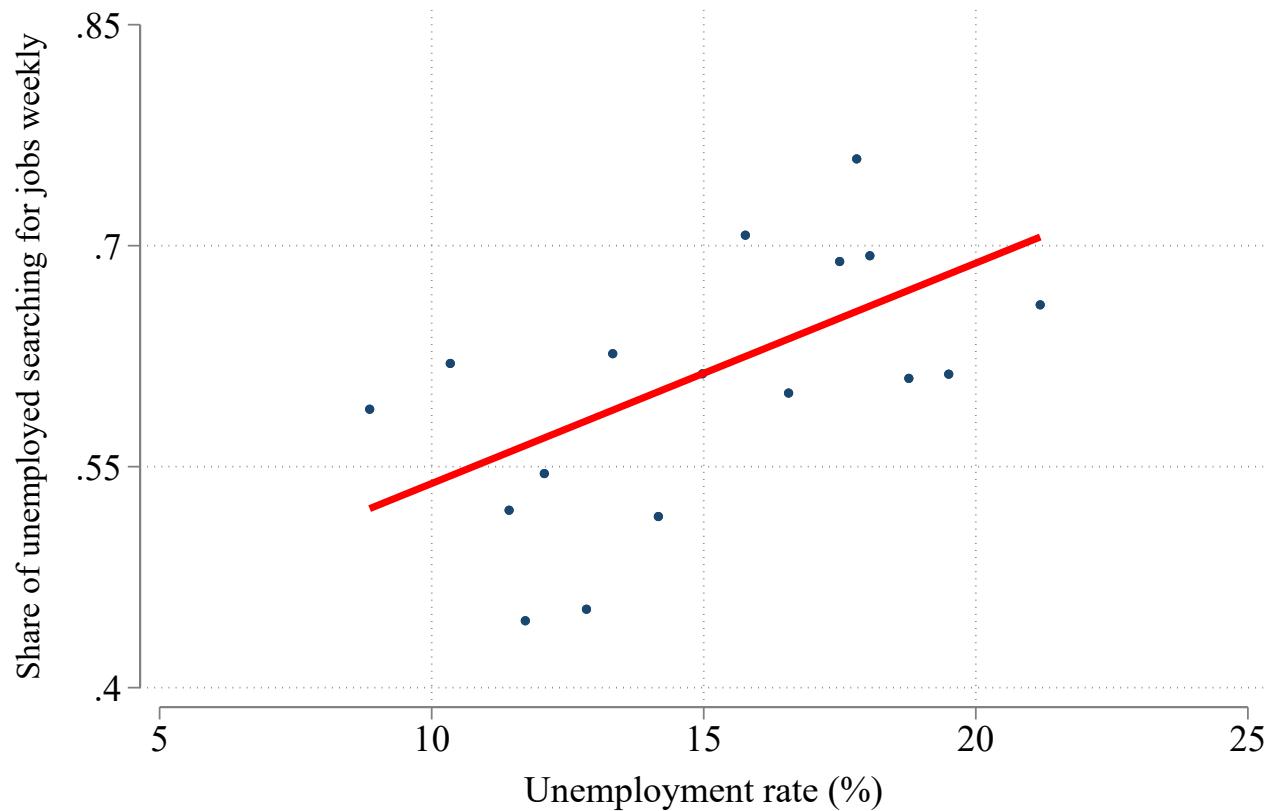
Note: This graph presents the magnitude of the Spanish unemployment fluctuations in relation to two prominent papers in the literature. Those papers use data from US ([Kroft and Notowidigdo, 2016](#)) and Germany ([Schmieder et al., 2012](#)). Blue bars correspond to the range of national unemployment rate in their country and period of study.

Figure A2: Preferences for Redistribution: Heterogeneity



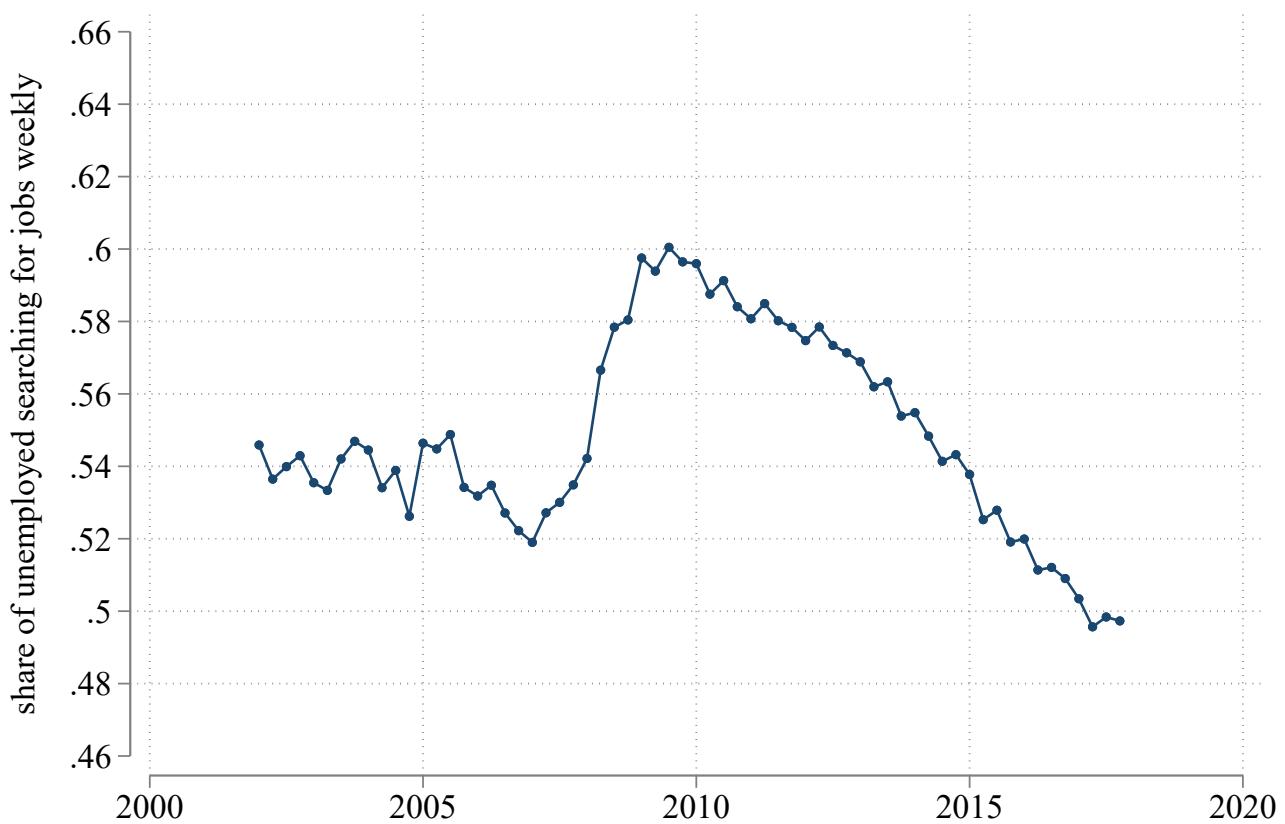
Note: The graph explores heterogeneity in preferences for redistribution between the different types of unemployed. It focuses on the qualitative question: *Imagine there are 2 unemployed individuals, A and B, who receive €950 while unemployed and are entitled to receive benefits for up to 14 months if remaining unemployed: A looked for jobs last week; B did not look for jobs last week. The government wants to transfer €1000 to individuals A and B in a one-time payment, and is thinking of how to allocate them. Please choose what allocation option you would prefer: More money to A than to B; More money to B than to A; Same amount to A and B.*, as described in Section 4.1.1. I summarize the answers in a dummy variable that equals one for individuals choosing to allocate more resources to the individual who searched for jobs last week, and zero otherwise. The plot depicts the average value for that variable for the different demographic characteristics elicited in the Preliminary Questions and Demographic blocks in the online survey, as shown in Appendix C. Impressionable years refer to 18-25 (Krosnick and Alwin, 1989). Point estimates are shown along 95% confidence intervals.

Figure A3: Unemployed's Search Effort Over the Business Cycle



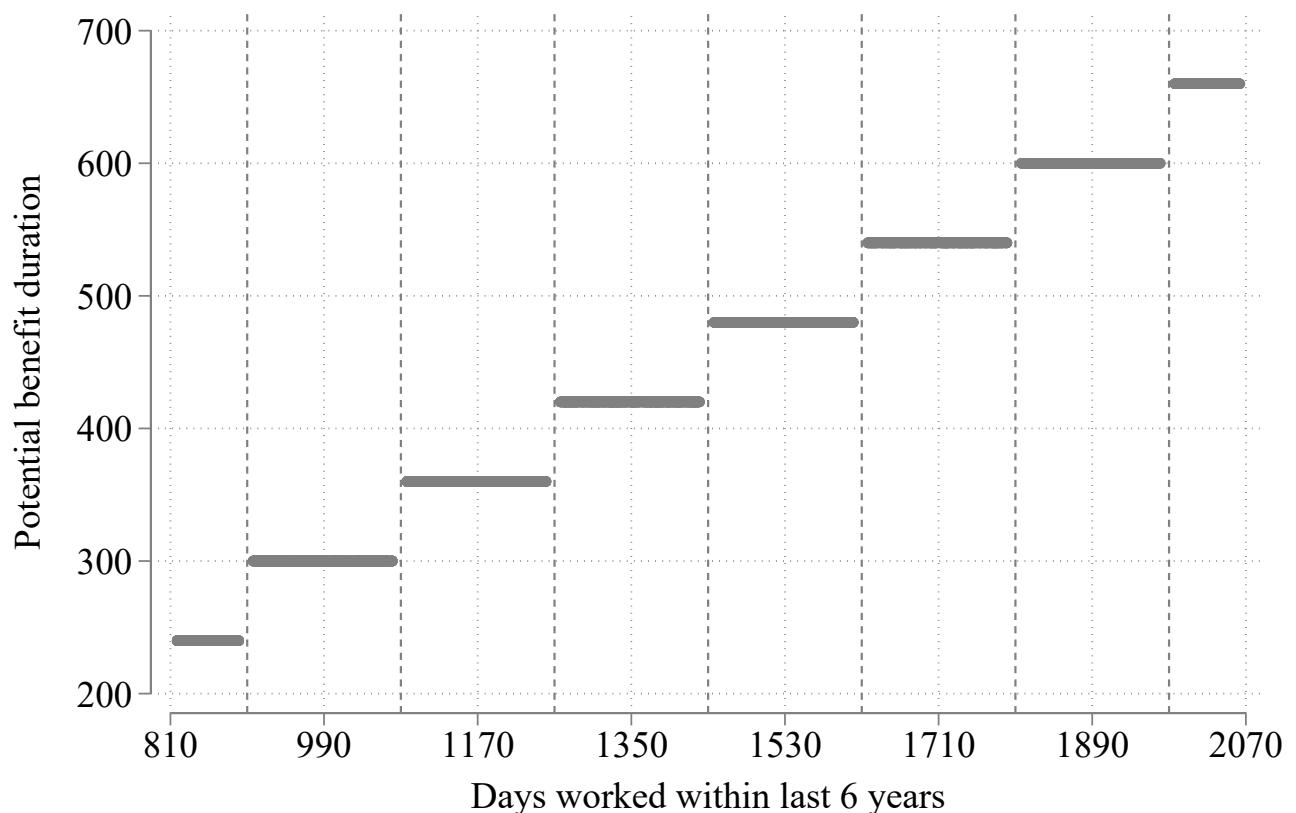
Note: The graph shows how search effort by the unemployed varies with economic conditions. It is built using the 2002-2003 and 2009-2010 waves of the Spanish Time Use data, and unemployment rate from the LFS. First, data on the probability of daily search is collapsed at the region level. Second, it is converted to weekly terms assuming search is independent across days. Third, it is residualized on region FEs, and weighted by population. More details on the methodology are presented in Appendix D.

**Figure A4: Unemployed's Search Effort Over the Business Cycle:
Composition Effect Based on Observables**



Note: The graph shows the component of search effort that varies over the business cycle due to composition shift in observable characteristics. It is built first estimating a model that relates the probability of daily search with a set of demographic characteristics in the Time Use data. These variables are: interactions between age categories and sex; interactions between education categories and sex; interaction between married status and sex; and unemployment rate, day of the week when diary was filled and region FEs. Then, I predict daily search based on that model using the same set of demographic characteristics into the Labor Force Survey. Finally, I convert to weekly terms following [Faberman et al. \(2022\)](#). The depicted change in search effort is therefore only due to a composition effect based on observables, and not driven by changes in search effort behavior within individual in response to economic conditions.

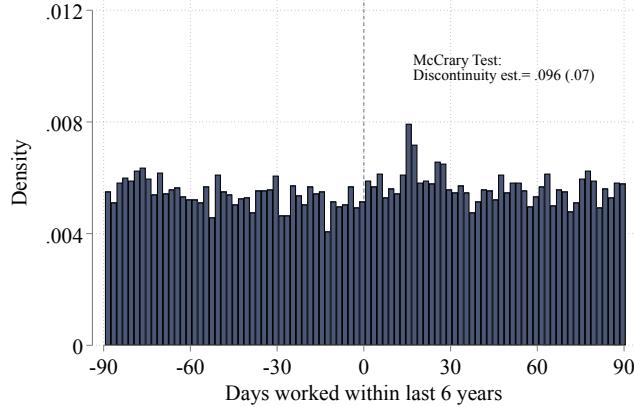
Figure A5: UI Schedule



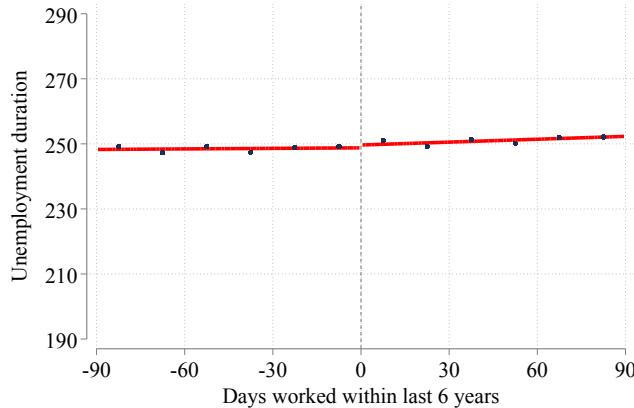
Note: The graph shows the Spanish Unemployment Insurance schedule. Specifically, it depicts the statutory relationship between recent work experience and potential benefit duration, measured in days.

Figure A6: Validity of the Design

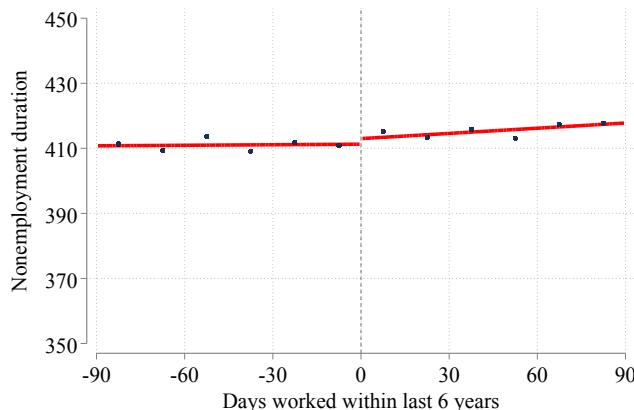
(a) Density



(b) Unemployment Duration



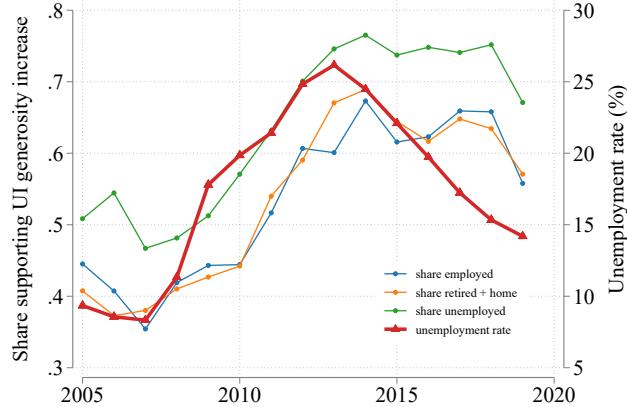
(c) Nonemployment Duration



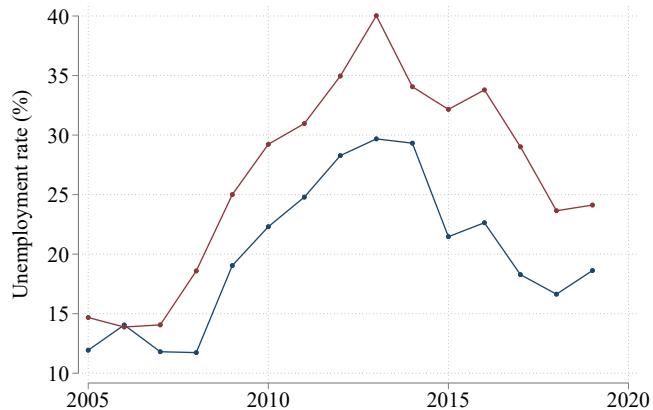
Note: Panel (a) follows [McCrory \(2008\)](#) to assess whether the density of the running variable presents any discontinuity at the normalized cutoff. Panels (b) and (c) plot the evolution of predicted unemployment and nonemployment duration around the normalized cutoff. This prediction is constructed using a linear model in the spirit of [Card et al. \(2015\)](#) including the following set of controls: regional unemployment rate, rural status, (log) previous earnings, sex, age, age squared, full-time share, three education categories, four occupation categories, and year, month and region fixed effects.

Figure A7: Support for Increase in UI Generosity - CIS Survey

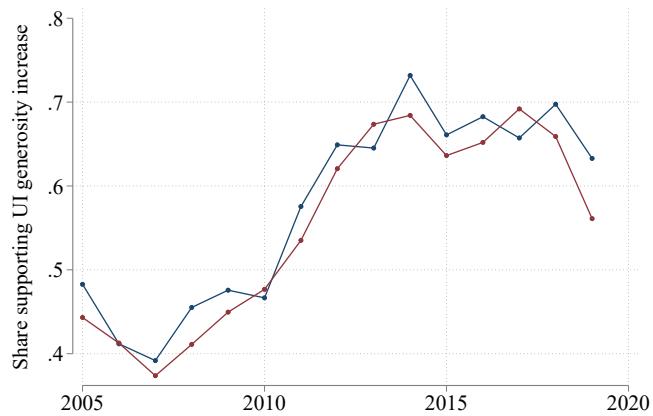
(a) Support by Demographic Groups



(b) Unemployment Rate by Shock Size



(c) Support by Shock Size



Note: The plots are obtained using data from the Spanish CIS survey on public finance issues over the years 2005-2019. Panel (a) shows, on the left axis, the evolution of the share of people supporting increases in UI generosity over the business cycle for different groups of individuals. I recode the answers to the question into a dummy variable that equals one if the respondent would like a more generous UI system, and zero otherwise. National unemployment rate is shown on the right axis. Panel (b) shows the unemployment rate for two groups of regions according to the intensity of the Great Recession shock. Specifically, I compute for each region the change in unemployment rate between 2007 and 2013, and create two groups containing regions below and above the median change in the sample. Panel (c) shows the evolution of the demand for UI generosity increase split by the same groups as in Panel (b).

Table A1: Unemployed's Search Effort Over the Business Cycle - Search Methods Across Countries

	All (1)	All (2)	Ask friends (3)	Ask friends (4)	Study job ads (5)	Study job ads (6)	Apply to employers (7)	Apply to employers (8)	Contact public service (9)	Contact public service (10)
Unemp. rate (%)	0.423 (0.0770)	0.308 (0.0761)	1.016 (0.227)	0.833 (0.235)	0.704 (0.344)	0.495 (0.473)	1.063 (0.246)	0.793 (0.245)	0.949 (0.599)	0.795 (0.547)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Mean	32.9	32.9	65	65	58.7	58.7	54.4	54.4	51	51
Countries	34	34	34	34	34	34	34	34	34	34
N	4868	4868	497	497	496	496	497	497	497	497
	Answer job ads (11)	Answer job ads (12)	Contact priv. agency (13)	Contact priv. agency (14)	Other (15)	Other (16)	Look for land (17)	Look for land (18)	Look for licenses (19)	Look for licenses (20)
Unemp. rate (%)	0.737 (0.143)	0.425 (0.174)	0.441 (0.196)	0.473 (0.316)	-0.615 (0.707)	-0.919 (0.519)	-0.027 (0.021)	0.005 (0.054)	-0.042 (0.027)	-0.007 (0.042)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Mean	41.5	41.5	20.5	20.5	14	14	1.8	1.8	1.7	1.7
Countries	34	34	34	34	34	34	34	34	34	34
N	496	496	496	496	438	438	492	492	492	492

Note: The table presents the relationship between the unemployment rate (%) and the percentage of unemployed that declared using each of the different search methods over the last 4 weeks. The data spans the years 2005-2019 and 34 countries. The data are obtained from Eurostat, which collects it from national Labor Force Surveys. The annual unemployment rate and population are also from Eurostat. Columns (1)-(2) pool all search methods. Columns (3)-(20) represent different search methods used to seek work ordered in the table according to usage, which include: contacting private employment agencies; applying to employers directly; asking friends, relatives, and trade unions; publishing or answering job advertisements; studying job advertisements; taking tests, interviews, or examinations; looking for land, premises, or equipment; looking for licenses, permits, or financial resources; and other methods. The countries included in the sample are Austria, Belgium, Bulgaria, Switzerland, Cyprus, Czechia, Germany, Denmark, Estonia, Spain, Finland, France, Croatia, Hungary, Ireland, Iceland, Italy, Lithuania, Luxembourg, Latvia, Montenegro, North Macedonia, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Sweden, Slovenia, Slovakia, Turkey and United Kingdom. For each method, regression results are presented from specifications with country FE and with/without year FE, along with the mean value of the dependent variable, the number of countries, and the number of country-year-method observations. Regressions are weighted by country population and standard errors, in parentheses, are clustered at the country level.

Table A2: Consumption Changes Upon Job Loss - Robustness

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Unemployed	-0.006 (0.031)	0.749 (0.801)	0.004 (0.059)	-0.004 (0.030)	-0.011 (0.031)	0.845 (0.783)	-0.008 (0.058)	-0.008 (0.030)
Unemployed × Unemp. rate (%)	-0.0041 (0.0013)	-0.0038 (0.0016)	-0.0039 (0.0015)	-0.0043 (0.0013)	-0.0040 (0.0012)	-0.0038 (0.0015)	-0.0039 (0.0014)	-0.0043 (0.0012)
Region FE	Yes							
Year FE	Yes							
Unemployment duration	No	Yes	No	No	No	Yes	No	No
Share unemp. 6-12 months	No	No	Yes	No	No	No	Yes	No
$\mathbb{1}[\text{year} \geq 2012]$	No	No	No	Yes	No	No	No	Yes
Controls	No	No	No	No	Yes	Yes	Yes	Yes
N	63304	63304	63304	63304	63304	63304	63304	63304

Note: The table explores sensitivity for the evolution of consumption changes upon unemployment over the business cycle. Columns (1) and (5) are the same ones as columns (2) and (5) in Table 1, which report results with and without controls for the benchmark specification, respectively. Column (2) interacts unemployed's consumption with a first and second order polynomial in unemployment duration, for the unemployed with duration up to one year. Column (3) interacts unemployed's consumption with the share of unemployed up to one year that have a duration between 6-12 months. Column (4) interacts unemployed's consumption with a dummy that equals one for the period from 2012 onwards, which corresponds to the period where the benefit level after 6 months was slightly decreased. Columns (6), (7) and (8) repeat the same specifications before and also include controls for type of household and the following set of covariates: age, sex, education, civil status, (log) number of individuals in household, number of household members working, number of household members unemployed, number of kids, rural status and house ownership. Standard errors are clustered at the region-year level and reported in parentheses.

Table A3: Marginal Cost - Robustness

	Pot. benefit duration (1)	Unemp. duration (3)	Nonemp. duration (5)	
	(2)	(4)	(6)	
$\mathbb{1}[Exp. > 0]$	56.38 (2.96)	55.64 (3.92)	13.49 (4.78)	14.77 (8.00)
$\mathbb{1}[Exp. > 0] \times \text{Unemp. rate (\%)}$		0.05 (0.26)	-0.09 (0.35)	-0.78 (0.73)
Region FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
N	13994	13994	13994	13994

Note: The table shows the marginal effect on potential benefit duration, unemployment duration and nonemployment duration. It also explores whether these relationships vary with regional unemployment rate. They are estimated following equation (13), including the following set of controls: regional unemployment rate, rural status, (log) previous earnings, sex, age, age squared, full-time share, three education categories, four occupation categories, and year, month and region fixed effects. Standard errors are clustered at the region level and reported in parentheses.

Appendix B Derivations

B.1 Model

I follow closely Chetty (2006) and Kolsrud et al. (2018), but consider differentiation of the unemployment benefit policy according to economic conditions and a social planner with fairness considerations based on willingness to work. Let $\xi_{i,t}$ refer to a vector of state variables containing all relevant information up to time t , which determines individual's employment status, aggregate economic conditions k and behavior at time t . $F_{i,t}(\xi_{i,t})$ denotes the unconditional distribution of $\xi_{i,t}$ given information available at time t . I assume $F_{i,t}$ is a cdf function and Ω denotes the maximal support of $F_{i,t}$ for $\forall i, t$. Aggregate economic conditions are denoted by $k \in \{B, R\}$.

Individuals choose each period how much to consume from income and assets, and how much effort to exert if unemployed. An employed individual earns $w_i - \tau$, and when unemployed receives $b_t^k + y_u$. The law of motion of assets when employed is $a_{i,t+1} = (1 + r)a_{i,t} + w_i - \tau - c_{i,t}^e$; and when unemployed is $a_{i,t+1} = (1 + r)a_{i,t} + b_t^k + y_u - c_{i,t}^u$, with $a_{i,t+1} \geq \bar{a}_i$. The Lagrange multipliers on these constraints are $\mu_{i,t}^{e,k}(\xi_{i,t})$, $\mu_{i,t}^{u,k}(\xi_{i,t})$ and $\mu_{i,t}^a(\xi_{i,t})$, respectively.

Let $\theta_{i,t}^{s,k}(\xi_{i,t})$ denote an individual's employment status s at time t in aggregate economic conditions k . When $\theta^{e,k} = 1$, the individual is employed in aggregate economic conditions k . When $\theta^{u,k} = 1$, the individual is unemployed in aggregate economic conditions k . They equal zero otherwise. Each individual is in one of four mutually exclusive labor market status, denoted by the combination of employment status and aggregate conditions. In each period t , an unemployed individual chooses a level of search effort $e_{i,t}$ as well. This search effort level determines the probability to leave unemployment for employment, with the mapping potentially depending on economic conditions. The individual probability of remaining unemployed in aggregate conditions k at time of the spell t is $S_{i,t}^k = \int \theta_{i,t}^{u,k}(\xi_{i,t}) dF_{i,t}(\xi_{i,t})$, with corresponding average probability in the population studied being $S_t^k = \int S_{i,t}^k di$. The share of time individuals who lose their jobs spend living in aggregate conditions k before retirement is $\alpha^k = \int \frac{1}{T} \sum_{t=1}^T \int [\theta_{i,t}^{e,k}(\xi_{i,t}) + \theta_{i,t}^{u,k}(\xi_{i,t})] dF_{i,t}(\xi_{i,t}) di$.

Each individual i chooses a program (e_i, c_i^u, c_i^e) where

$$e_i = \{e_{i,t}(\xi_{i,t})\}_{t \in \{1, 2..T\}, \xi_{i,t} \in \Omega, \theta^{u,k}(\xi_{i,t})=1},$$

$$c_i^u = \{c_{i,t}^u(\xi_{i,t})\}_{t \in \{1, 2..T\}, \xi_{i,t} \in \Omega, \theta^{u,k}(\xi_{i,t})=1},$$

$$c_i^e = \{c_{i,t}^e(\xi_{i,t})\}_{t \in \{1, 2..T\}, \xi_{i,t} \in \Omega, \theta^{e,k}(\xi_{i,t})=1},$$

to solve

$$\begin{aligned}
V_{i,0}(P) = & \max \sum_{t=1}^T \beta^{t-1} \int \{ \Sigma_k [u_i(c_{i,t}^u(\xi_{i,t}), e_{i,t}(\xi_{i,t})) \theta_{i,t}^{u,k}(\xi_{i,t}) + v_i(c_{i,t}^e) \theta_{i,t}^{e,k}(\xi_{i,t})] \} dF_{i,t}(\xi_{i,t}) \\
& + \sum_{t=1}^T \beta^{t-1} \int \{ \Sigma_k \mu_{i,t}^{u,k}(\xi_{i,t}) [(1+r)a_{i,t-1}(\tilde{\xi}_{i,t-1}) + b_t^k - c_{i,t}^u(\xi_{i,t}) - a_{i,t}] \theta_{i,t}^{u,k}(\xi_{i,t}) \} dF_{i,t}(\xi_{i,t}) \\
& + \sum_{t=1}^T \beta^{t-1} \int \{ \Sigma_k \mu_{i,t}^{e,k}(\xi_{i,t}) [(1+r)a_{i,t-1}(\tilde{\xi}_{i,t-1}) + w_i - \tau - c_{i,t}^e(\xi_{i,t}) - a_{i,t}] \theta_{i,t}^{e,k}(\xi_{i,t}) \} dF_{i,t}(\xi_{i,t}) \\
& + \sum_{t=1}^T \beta^{t-1} \int \mu_{i,t}^a(\xi_{i,t}) [\bar{a}_i - a_{i,t+1}] dF_{i,t}(\xi_{i,t}),
\end{aligned}$$

where the short-hand notation $\tilde{\xi}_{i,t-1}$ denotes the vector of state variables at time $t-1$ that preceded the vector of state variables $\xi_{i,t}$ at time t . While in the empirical implementation in the main text I consider separability of utility between consumption and effort, here I allow for non-separability in the characterization. In the framework, the individual starts unemployed and remains active until T , with employment being an absorbing state. The individual's exit rate out of unemployment in aggregate economic conditions k at time t depends on her search effort at time t . The present value of the government's budget is

$$G(P) = \sum_{t=1}^T \frac{1}{(1+r)^{t-1}} \int \int \{ \Sigma_k [-b_t^k \theta_{i,t}^{u,k}(\xi_{i,t}) + \tau \theta_{i,t}^{e,k}(\xi_{i,t})] \} dF_{i,t}(\xi_{i,t}) di.$$

The government solves

$$\max \int \omega(\bar{e}_i) V_{i,0}(P) di + \lambda[G(P) - \bar{G}],$$

where $\omega(\cdot)$ is a welfare weight, λ is the Lagrange multiplier on the government's budget constraint and \bar{G} is an exogenous revenue constraint. The welfare weight is assumed to depend on willingness to work \bar{e}_i , which is defined as the average effort level exerted by individuals when faced with aggregate economic conditions as in boom period and a fixed benefit policy:

$$\bar{e}_i = E_t[e_{i,t} | \theta_{i,t}^{u,B} = 1, P],$$

The characterization is based on local policy changes and thus only allows for local tests and recommendations. For the ability to translate globally, the program would need to be strictly concave in P . To provide tractable expressions of local welfare implications I assume that the social welfare function is differentiable.

Unemployment Policy. Following Chetty (2006), I assume that lifetime utility is smooth, increasing and strictly quasi-concave in (c_i^u, c_i^e, e_i) and that the value function $V_{i,0}(P)$ is differentiable such that the envelope theorem applies.

The welfare impact of a change in the unemployment benefit b_{P+1}^k equals

$$\frac{\partial W(P)}{\partial b_{P+1}^k} = \int \omega(\bar{e}_i) \frac{\partial V_{i,0}(P)}{\partial b_{P+1}^k} di + \lambda \frac{\partial G(P)}{\partial b_{P+1}^k},$$

where, using $S_t^{r,k} = S_t^k / [1 + r]^{(t-1)}$,

$$\begin{aligned} \frac{\partial G(P)}{\partial b_{P+1}^k} &= -\alpha^k S_{P+1}^{r,k} - \alpha^k \sum_{t'=1}^T (b_{t'}^k + \tau) \frac{\partial S_{t'}^{r,k}}{\partial b_{P+1}^k} - \alpha^{k'} \sum_{t'=1}^T (b_{t'}^{k'} + \tau) \frac{\partial S_{t'}^{r,k'}}{\partial b_{P+1}^k} \\ &\approx -\alpha^k S_{P+1}^{r,k} - \alpha^k \sum_{t'=1}^T (b_{t'}^k + \tau) \frac{\partial S_{t'}^{r,k}}{\partial b_{P+1}^k} \\ &= -\alpha^k S_{P+1}^k - \alpha^k \frac{\partial D_b^k}{\partial b_{P+1}^k} b - \alpha^k \frac{\partial D^k}{\partial b_{P+1}^k} \tau \end{aligned}$$

where the second line approximation relies on the effect of extending benefit duration in a given economic condition having small effect of individuals' behavior while unemployed in other economic conditions, and the last line follows from the simplification $r = 0$ and a constant benefit policy paying b up to period P and zero afterwards as in the main text, and

$$\begin{aligned} \int \omega(\bar{e}_i) \frac{\partial V_{i,0}(P)}{\partial b_{P+1}^k} di &= \beta^P \int \int \omega(\bar{e}_i) \frac{\partial u_i^u(c_{i,P+1}^u(\xi_{i,P+1}), e_{i,P+1}(\xi_{i,P+1}))}{\partial c_{i,P+1}^u} \theta_{i,P+1}^{u,k}(\xi_{i,P+1}) dF_{i,P+1}(\xi_{i,P+1}) di \\ &= \alpha^k S_{P+1}^k E \left[\omega(\bar{e}_i) \frac{\partial u_i^u(c_{i,t}^u(\xi_{i,t}), e_{i,t}(\xi_{i,t}))}{\partial c_{i,t}^u} \middle| t = P+1, \theta_{i,t}^{u,k} = 1 \right], \end{aligned}$$

where the last line follows from the simplification $\beta = 1 + r = 1$. The expectation operator thus averages over all potential states in which individuals are unemployed at time $P+1$ in aggregate conditions k . The weight of individual i 's marginal utility in calculating the average marginal utility among the unemployed at time t is scaled by $S_{i,t}^k / S_t^k$.

Combining the two expressions, I find

$$\frac{\partial W(P)}{\partial b_{P+1}^k} = 0 \Leftrightarrow E_{P+1}^{u,k} \left[\omega(\bar{e}_i) \frac{\partial u_i^u(c_{i,t}^u(\xi_{i,t}), e_{i,t}(\xi_{i,t}))}{\partial c_{i,t}^u} \right] = \lambda \left[1 + \frac{1}{S_{P+1}^k} \left[\frac{\partial D_b^k}{\partial b_{P+1}^k} b + \frac{\partial D^k}{\partial b_{P+1}^k} \tau \right] \right],$$

Thus, changing the unemployment benefit duration in both boom and recession, and combining expressions, I obtain:

$$\frac{E_{P+1}^{u,R} \left[\omega(\bar{e}_i) \frac{\partial u_i^u(c_{i,t}^u(\xi_{i,t}), e_{i,t}(\xi_{i,t}))}{\partial c_{i,t}^u} \right]}{E_{P+1}^{u,B} \left[\omega(\bar{e}_i) \frac{\partial u_i^u(c_{i,t}^u(\xi_{i,t}), e_{i,t}(\xi_{i,t}))}{\partial c_{i,t}^u} \right]} = \frac{1 + \frac{1}{S_{P+1}^R} \left[\frac{\partial D_b^R}{\partial b_{P+1}^R} b + \frac{\partial D^R}{\partial b_{P+1}^R} \tau \right]}{1 + \frac{1}{S_{P+1}^B} \left[\frac{\partial D_b^B}{\partial b_{P+1}^B} b + \frac{\partial D^B}{\partial b_{P+1}^B} \tau \right]}.$$

which corresponds to equation (5) in the main text.

B.2 Implementation Assumptions

- *Assumption 1* - Relevant heterogeneity in consumption only across boom and recession, not within unemployed in the same aggregate economic condition: $c_{i,t}^{u,k} = c_t^{u,k}$ ⁴⁵
- *Assumption 2* - Homogeneous preferences: $u_i(c) = v_i(c) = u(c)$
- *Assumption 3* - Homogeneous relative risk aversion: $\gamma^k \approx \gamma$ (where $\gamma^k = \frac{-u''(c^{u,k})c^{u,k}}{u'(c^{u,k})}$)
- *Assumption 4* - Taylor approximation for $u'(c^{u,k})$ around $c^{e,k}$:

$$\begin{aligned} u'(c^{u,k}) &\approx u'(c^{e,k}) + u''(c^{e,k})(c^{u,k} - c^{e,k}) \\ &= u'(c^{e,k}) \left[1 + \gamma \frac{c^{e,k} - c^{u,k}}{c^{e,k}} \right] \end{aligned}$$

Thus, we arrive at the expression in the main text:

$$\begin{aligned} \frac{E_{P+1}^{u,R}[\omega(\bar{e}_i)u'(c_{i,P+1}^u)]}{E_{P+1}^{u,B}[\omega(\bar{e}_i)u'(c_{i,P+1}^u)]} &\approx \frac{\omega^R}{\omega^B} \frac{u'(c^{u,R})}{u'(c^{u,B})} \\ &\approx \frac{\omega^R}{\omega^B} \frac{1 + \gamma \frac{c^{e,R} - c^{u,R}}{c^{e,R}}}{1 + \gamma \frac{c^{e,B} - c^{u,B}}{c^{e,B}}} \frac{u'(c^{e,R})}{u'(c^{e,B})} \\ &\approx \frac{\omega^R}{\omega^B} \frac{1 + \gamma \frac{c^{e,R} - c^{u,R}}{c^{e,R}}}{1 + \gamma \frac{c^{e,B} - c^{u,B}}{c^{e,B}}} \left[1 + \gamma \frac{c^{e,B} - c^{e,R}}{c^{e,B}} \right] \end{aligned}$$

where the second line follows from another Taylor approximation of $u'(c^{e,R})$ around $u'(c^{e,B})$.

B.3 Welfare Impact

Consider a reform where $\frac{db_{P+1}^R}{db_{P+1}^B} < 0$ such that the budget remains balanced:

$$\alpha^R S_{P+1}^R b_{P+1}^R = \alpha^B S_{P+1}^B b_{P+1}^B \Rightarrow \alpha^R S_{P+1}^R (1 + FE^R) db_{P+1}^R = -\alpha^B S_{P+1}^B (1 + FE^B) db_{P+1}^B$$

$$\begin{aligned} dW &= \alpha^R S_{P+1}^R E_{P+1}^{u,R} [\omega(\bar{e}_i)u'(c_{i,P+1}^u)] db_{P+1}^R + \alpha^B S_{P+1}^B E_{P+1}^{u,B} [\omega(\bar{e}_i)u'(c_{i,P+1}^u)] db_{P+1}^B - \\ &\quad - \lambda [\alpha^R S_{P+1}^R (1 + FE^R) db_{P+1}^R + \alpha^B S_{P+1}^B (1 + FE^B) db_{P+1}^B] \\ &= \alpha^R S_{P+1}^R E_{P+1}^{u,R} [\omega(\bar{e}_i)u'(c_{i,P+1}^u)] db_{P+1}^R - \alpha^B S_{P+1}^B E_{P+1}^{u,B} [\omega(\bar{e}_i)u'(c_{i,P+1}^u)] \frac{\alpha^R S_{P+1}^R (1 + FE^R)}{\alpha^B S_{P+1}^B (1 + FE^B)} db_{P+1}^R \end{aligned}$$

⁴⁵When there is heterogeneity within the same economic conditions, one needs to account for the covariance between marginal utility and welfare weights (and risk aversion parameter if not assumed to be constant) (Andrews and Miller, 2013; Kolsrud et al., 2024).

where the second equality follows from the budget neutrality of the reform.

$$\begin{aligned} \frac{dW/\alpha^R S_{P+1}^R db_{P+1}^R}{E_{P+1}^{u,B}[\omega(\bar{e}_i)u'(c_{i,P+1}^u)]} &= \underbrace{\frac{E_{P+1}^{u,R}[\omega(\bar{e}_i)u'(c_{i,P+1}^u)]}{E_{P+1}^{u,B}[\omega(\bar{e}_i)u'(c_{i,P+1}^u)]}}_{=1.64} - \underbrace{\frac{1+FE^R}{1+FE^B}}_{=0.86} \\ &= \mathbf{0.78} \end{aligned}$$

where welfare is measured in monetary terms relative to $E_{P+1}^{u,B}[\omega(\bar{e}_i)u'(c_{i,P+1}^u)]$, which denotes the average welfare-weighted marginal utility for the individuals unemployed in boom (with boom and recession referring to 8% and 26% unemployment rate, respectively).

Appendix C Online Survey



Instructions (Information Sheet)

You are invited to participate in this survey, which investigates the preferences of Spanish people for public policies. It takes approximately 8 minutes. When you complete it, you will receive panel points worth €1.15 as a reward.

We are a non-partisan group of researchers affiliated to University College London. Our goal is to understand preferences about various social policies. It is very important that you respond honestly. No matter what your political views are, this is an important question and by completing this survey, you are contributing to our knowledge as a society.

Anytime you don't know an answer, just give your best guess.

All the information collected about you is treated confidentially. The information is only used for scientific purposes and the survey is registered at University College London. This is intended to be used for academic publication, a chapter of a PhD thesis and potentially for subsequent research. You have been chosen to participate because you are aged 25-64 and are representative of the Spanish population. Participation is voluntary and you can withdraw at any point if you wish. **The data are anonymized and you will not be individually identified from responses.** There are no direct risks or benefits for you from taking part in the survey, beyond the monetary reward. This project has received approval by the UCL Research Ethics Committee (#21191/001). In case you have doubts or complaints, you can contact the corresponding member of the Research Team (jon.piqueras.17@ucl.ac.uk) or the Ethics Committee (ethics@ucl.ac.uk). The title of the study is "Redistribution and Social Insurance Design". This project is funded by the Institute for Fiscal Studies.

Local Data Protection Privacy Notice:

The controller for this project will be University College London (UCL). The UCL Data Protection Officer provides oversight of UCL activities involving the processing of personal data. This "local" privacy notice sets out the information that applies to this particular study. Further information on how UCL uses participant information can be found in our "general" privacy notice ([here](#)). The categories of personal data used will be as follows: year of birth, gender, province of residence, employment status, income, socio-economic status, education, postcode. The lawful basis that will be used to process your personal data are: "Public task" for personal data and "Research purposes" for special category data. Your data will be anonymized at any point and therefore it cannot be withdrawn. If you are concerned about how your personal data is being processed, or if you would like to contact us about your rights, please contact UCL in the first instance at data-protection@ucl.ac.uk.

Thank you for reading this information sheet and for considering to take part in this research study. If you agree with these terms, please continue reading the consent form below before you start.

Consent Form

I confirm that I understand that by clicking "Next" below I am consenting to ALL these elements of the study. I understand that by not giving consent to these elements I may be deemed ineligible for the study.

- I confirm that I have read and understood the Information Sheet for the above study. I have had an opportunity to consider the information and what will be expected of me.
- I consent to participate in the study. I understand that my personal information will be used for the purposes explained to me. I understand that according to data protection legislation, "public task" will be the lawful basis for processing.
- I understand that my data gathered in this study will be stored anonymously and securely. It will not be possible to identify me in any publications.
- I understand that my participation is voluntary and that I am free to withdraw at any time without giving a reason.
- I understand the direct/indirect benefits and risks of participating.
- I understand that I will be compensated if I complete the survey.
- I agree that my anonymized research data may be used by others for future research.
- I hereby confirm that I understand the inclusion criteria as detailed in the Information Sheet.
- I am aware of who I should contact if I wish to lodge a complaint.
- I voluntarily agree to take part in this study.

Next

Preliminary Questions

What is your year of birth?

What is your sex?

- Male
 - Female
-

What is your current employment status?

- Full-time employment
 - Part-time employment
 - Unemployed looking for jobs
 - Other (for example, student or retired)
 - Disabled/unable to work
-

What is your highest educational level?

- Primary education
 - Secondary education
 - Baccalaureate/professional training
 - Bachelors degree
 - Masters degree
 - PhD
-

[Next](#)

Demographics

What is your province of residence?

What is the duration of your usual workday? (for example, 100% corresponds to full time and 50% to part time)

- 0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

What is your gross monthly labor income if employed, or benefits if unemployed? (that is, before taxes, without decimals, in €)

What is your current type of job?

- Permanent
 Temporary
 Self employed
 Not working

How many children do you have (younger than 26 years old)?

How much do you have in savings (savings in current account + value of other assets you own - debt, in €)?

While you were 18-25 years old, was any of your parents more than one year unemployed?

- Yes
 No

While you were 18-25 years old, did your parents have difficulties to make ends meet?

- Yes
 No

Next

Opinions on Public Policy

Imagine there are 2 unemployed individuals, A and B, who receive €950 while unemployed and are entitled to receive benefits for up to 14 months if remaining unemployed:

- Individual A looked for jobs last week
- Individuo B did not look for jobs last week

The government wants to transfer €1000 to individuals A and B in a one-time payment, and is thinking of how to allocate them. Please choose what allocation option you would prefer:

- More money to A than to B
- More money to B than to A
- Same amount to A and B

Next

Opinions on Public Policy

Imagine there are 2 unemployed individuals, A and B, who receive 950€ while unemployed and are entitled to receive benefits for up to 14 months if remaining unemployed:

- Individual A looked for jobs last week
- Individual B did not look for jobs last week

The government wants to transfer €1000 to individuals A and B in a one-time payment, and is thinking of how to allocate them. Now imagine that an unequal allocation may be costly. That is, it can allocate €500 each, or more to one than the other, but the latter option may result in the total amount of resources that can be distributed being reduced.

Please choose, for each pair of options below, what allocation option you would prefer:

Individual A looked for jobs last week

Individual B did not look for jobs last week

What amounts (€) would you prefer for individuals A and B?

- 550 for A, 450 for B
- 500 for A, 500 for B

Individual A looked for jobs last week

Individual B did not look for jobs last week

What amounts (€) would you prefer for individuals A and B?

- 350 for A, 550 for B
- 500 for A, 500 for B

Individual A looked for jobs last week

Individual B did not look for jobs last week

What amounts (€) would you prefer for individuals A and B?

- 150 for A, 550 for B
- 500 for A, 500 for B

Individual A looked for jobs last week

Individual B did not look for jobs last week

What amounts (€) would you prefer for individuals A and B?

- 500 for A, 500 for B
- 450 for A, 550 for B

Individual A looked for jobs last week

Individual B did not look for jobs last week

What amounts (€) would you prefer for individuals A and B?

- 500 for A, 500 for B
- 250 for A, 550 for B

Next

Opinions on Public Policy

Individual A looked for jobs last week

Individual B did not look for jobs last week

What amounts (€) would you prefer for individuals A and B?

- 50 for A, 550 for B
- 500 for A, 500 for B

Individual A looked for jobs last week

Individual B did not look for jobs last week

What amounts (€) would you prefer for individuals A and B?

- 500 for A, 500 for B
- 550 for A, 300 for B

Individual A looked for jobs last week

Individual B did not look for jobs last week

What amounts (€) would you prefer for individuals A and B?

- 550 for A, 350 for B
- 500 for A, 500 for B

Individual A looked for jobs last week

Individual B did not look for jobs last week

What amounts (€) would you prefer for individuals A and B?

- 500 for A, 500 for B
- 300 for A, 550 for B

Individual A looked for jobs last week

Individual B did not look for jobs last week

What amounts (€) would you prefer for individuals A and B?

- 500 for A, 500 for B
- 550 for A, 400 for B

Next

General Opinions (last questions)

When you were asked before about your preferred allocation of the €1000, you answered you would prefer to give "More money to A than to B".

(Note: Remember that A looked for jobs last week, and B did not look for jobs last week).

Please, explain why you chose that option:

There exists the idea that the benefits received by each unemployed could be more generous (higher benefit level or duration) at times when economic conditions are bad (high unemployment rate), relative to times where economic conditions are good (low unemployment rate).

Some reasons for that are that when the economic conditions are bad, the unemployed suffer larger consumption reductions upon job loss and the type of unemployed at that moment are, on average, people who put more effort into job finding but who face more difficulties given the lack of job offers.

Would you agree with having unemployment benefits changing with economic conditions in this way?

- Yes
- No

We want to improve the survey and your opinion matters. Please, write below if you have any comment about the questions, the survey structure or whether the questions are clear/intuitive (in case you do not have comments, write NO).

Next

100%

Many thanks for answering the questions!

Please click on "End survey" to end your participation.

[End survey](#)

Appendix D Time Use Data

A key input of the framework in the main text is the share of unemployed individuals who searched for jobs over the last week, and how it varies with economic conditions. Here I provide a more detailed explanation of how I estimate these statistics. The data used are the two available waves (2002-2003 and 2009-2010) of the Spanish Time Use survey, which is similar to the American Time Use Survey (ATUS) in the US. Since this survey oversamples individuals during Fridays, Saturdays and Sundays, I estimate averages at the daily level for the variable of interest — share of individuals with positive search time — and then aggregate by adding up all the days of the week. I compute these averages at the region (CCAA)-year level, which is the lowest geographical level available. I also employ data on unemployment rate at this same level from the Statistical National Institute (INE).

While time use surveys provide very detailed information on the activities of individuals throughout the day, they have the caveat that individuals only fill the diary once, and so we cannot see how the same individual behaves over the whole week. Given that my statistic of interest is the share of individuals who searched last week, I estimate this from the daily probability of search. To do so, I follow [Faberman et al. \(2022\)](#) who compare their estimates from the Survey of Consumer Expectations (SCE) with the ones obtained with ATUS, and provide a framework to map daily probability of job search into weekly share of searchers. The advantage of SCE is that individuals are asked specifically about whether they searched for jobs last week, and not just one day as in ATUS. For this exercise, they leverage the fact that in the UK time use survey, individuals fill diaries for two consecutive days, which provides information about what share of individuals search frequently. They find that 35 % of the unemployed who search one day, repeat again the next day. They assume that (i) there are two types of searchers: steady or intermittent job seekers; (ii) individuals observed searching two days in a row are steady job seekers who search every day; (iii) individuals who do not search two days in a row are intermittent job seekers who search only once per week and could therefore be randomly observed looking for work on any day of the week. Based on this statistic, they assume that in the US 35% of unemployed search every day of the week and the rest only once per week, resulting in the following probability of weekly search:

$$\pi_{\text{week}_j} = \mu_j^{uk} \pi_j^{\text{day}} + 7(1 - \mu_j^{uk}) \pi_j^{\text{day}}$$

which provides a good approximation for their estimate with SCE data. Thus, I apply this to the Spanish data and obtain that the weekly share of searchers ranges between 50% in boom and 95% in recession. The analysis residualizes the variables on region FEs to not compare regions

that are structurally different and focus on the variation over the business cycle. Panel (e) of Figure 1 depicts the results.

Moreover, I also provide results estimating the share of weekly searchers using a different approach to prove the robustness of the findings. To do so I instead assume that search is independent across days, and just compute the probability of not searching in a week as $\pi_{\text{week}_j} = 1 - (1 - \pi_j^{\text{day}})^7$. This is a similar approach to [Braun \(2022\)](#), who computes the share at the monthly level instead. Results are shown in Figure A3. Reassuringly, even in this case under a strong independence assumption, the share ranges between 52% and 78%, which implies a relatively lower increase but still a substantial shift which is in line with the baseline finding.

Appendix E Public Opinion Polls

As described in the main text, the empirical implementation of the framework suggests that the UI system should be more generous when economic conditions worsen. Here I explore public opinions about this type of reform, presenting two pieces of suggestive evidence on the political economy of a cycle-dependent benefit reform. First, in the online survey I designed, respondents are also asked whether they would support a UI reform of the type described in this paper. The objective of this question is to assess whether they agree with the interpretation of their answers through the lens of my framework. Panel (d) of Figure 1 shows that a majority of people state they would be likely to support a UI reform of the type described above.

Second, I draw on annual public opinion surveys over the years 2005-2019. This information on public attitudes towards certain public policies comes from the individual-level files of the Public Opinion and Fiscal Policy Survey (*Encuesta de Opinión Pública y Política Fiscal*) carried out by the Spanish CIS. This is a representative sample, eliciting opinions on several public policy issues over time. My analysis focuses on a question repeated every year that asks whether the unemployment benefits provided should be same/more/less generous than in the given year. I combine the waves for the years 2005-2019⁴⁶. Here I focus on a question asked every year about whether they think that the government should devote more/less/same resources to UI than are provided at each point in time. I classify individuals as demanding more generous UI when they state that more resources should be devoted. The evolution of the answers to this question over the cycle are shown in Figure A7. Panel (a) shows that people demand more generous UI when economics conditions are bad, with a remarkable increase in this demand that parallels the increase in the unemployment rate. Although I am not able to isolate mechanisms in this analysis, a potential explanation is that the probability of receiving benefits goes up in recession (probability of paying taxes goes down), so people just respond in that way that because they will be more likely to benefit directly from the reform, and not because they consider that there is a higher value of transferring resources towards the type of individuals unemployed in recessions. However, the same plot reveals that the increase in UI demand is common across groups (employed, unemployed, retired)⁴⁷, and thus does not depend on the group-specific probability of receiving benefits which varies across them. To gain further insights, in Panels (b)

⁴⁶The annual samples consist of around 2500 individuals, so the total sample contains information on approximately 38000 individuals.

⁴⁷The increase in support for a more generous UI system when economic conditions worsen could be just driven by a group composition effect: if the unemployed support more UI increases than the employed on average, the fact that more people become unemployed in recession could explain the increase in the support for UI. It is not the case, which can also be shown using a shift-share decomposition of the change in UI support from trough to peak (2005-2014): $UI_t - UI_{t-1} = \sum s_{i,t-1}(UI_{i,t} - UI_{i,t-1}) + (s_{i,t} - s_{i,t-1})UI_{i,t}$, where the change in the within-group component accounts for 95% of the overall increase.

and (c) I divide regions in two groups by the size of the region unemployment shock experienced in order to see whether regions that are hit relatively harder by the Great Recession increase their support for higher UI generosity more. I find again that the increase is common across groups and not related to the change in the unemployment risk. Although more suggestive, this complementary evidence is consistent with people taking into account other dimensions beyond their own unemployment risk, and supporting more generous UI when economic conditions deteriorate.