Introducing Flexicurity: Labor Market Effects of an Unemployment Insurance Reform and Severance Pay*

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Abstract

In July 2017, Lithuania moved toward *flexicurity* by significantly increasing the generosity of unemployment insurance (UI) while simultaneously decreasing firing costs. We use administrative data of the universe of Lithuanian workers to quantify labor market effects of i) the reform, which increased the potential benefit duration and the monthly benefit level by 50 percent, and ii) variation in severance pay. Our estimates imply that the elasticity of the non-employment duration w.r.t. a proportional increase in both policy parameters is between 0.4 and 0.6, and the elasticity of the benefit duration is between 0.7 and 0.8, suggesting a substantial fiscal cost. On the other hand, receiving severance pay increases the probability of survival in non-employment in the first months of unemployment by 5 percentage points. This suggests that liquidity constraints play a relevant role for the unemployed, and additional UI provides valuable insurance. Finally, we find very limited evidence for an effect of the reform on re-employment wages.

JEL: *H53, J20, J65*
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1 Introduction

Unemployment insurance (UI) provides valuable consumption insurance for liquidity-constrained workers. At the same time, increasing UI generosity is costly since it prolongs non-employment spells. In particular, it causes moral hazard by distorting the relative prices of leisure and consumption. A large empirical literature summarized in Le Barbanchon et al. (2024) documents this trade-off. However, disentangling moral hazard from liquidity effects remains challenging. In particular, while contingent benefits such as UI distort the relative price of leisure and consumption, non-contingent transfers—such as severance pay—relax liquidity constraints without directly affecting job search incentives. Comparing labor supply responses to these two forms of insurance provides a powerful way to assess the mechanisms underlying unemployment duration (Chetty, 2008).

In this paper, we study a major labor market reform implemented in Lithuania in July 2017 that simultaneously increased the generosity of unemployment insurance while reducing the stringency of employment protection. The reform provides a unique opportunity to study a shift toward *flexicurity*, as Lithuania's replacement rates are among the highest in OECD countries (OECD, 2024). Moreover, Lithuanian rules for severance pay are based on tenure, which provides quasi-experimental variation in severance pay around tenure thresholds. This setting allows us to examine how changes in unemployment insurance and severance pay affect job search behavior during unemployment and subsequent reemployment outcomes.

We combine this policy change with register data from the Social Security Administration covering employment histories, earnings, and welfare benefit receipt for all residents. The richness of the data allows us to track benefit receipt, non-employment duration, severance payments, and post-unemployment earnings at a high frequency. Exploiting the sharp timing of the reform, we estimate causal effects using difference-in-differences and regression discontinuity.

Our estimates imply that the elasticity of the non-employment duration with respect to a proportional increase in both policy parameters is between 0.4 and 0.6, and the elasticity of the benefit duration is between 0.7 and 0.8, suggesting a substantial fiscal cost. On the other hand, receiving severance increases the probability of survival in non-employment in the first months of unemployment by 5 percentage points. So far, we have only provided descriptive evidence on the effect of severance pay, but an update to the paper will include estimates based on quasi-experimental variation. Nonetheless, the finding suggests that liquidity constraints play a relevant role for the unemployed, and additional UI provides valuable insurance.

In a survey of papers that estimate duration elasticities w.r.t. UI changes, Schmieder and von Wachter (2016) report a wide range of elasticities with a median elasticity of the unemployment duration w.r.t the benefit level of 0.53 and w.r.t. the potential benefit duration of 0.40. Given that our estimates reflect reactions to increases in both policy parameters, they are at the lower end compared to previous findings.

We also study the effect of the reform on re-employment wages and find that it increases the probability that earnings in the first full month of employment after a jobless spell exceed those in the last full month before becoming unemployed by 5 percentage points. However, wage growth in Lithuania has been very strong in our observational period, such that re-employment wages

are, on average, higher than wages before becoming unemployed (commonly wages after non-employment spells are found to be lower than before, see e.g. Nekoei and Weber, 2017; Schmieder et al., 2016). Therefore, the increase in wages might be attributable to the overall wage growth, which mechanically leads to higher re-employment wages relative to pre-unemployment wages, the longer the non-employment spell, even if longer non-employment does not increase match quality. In the next version of this paper, the reform effect on re-employment wages will be decomposed into this wage growth effect and a potential effect on match quality.

A large literature quantifies the effects of changes in the potential benefit duration or the benefit level on benefit and non-employment durations. We add to three particular strands of this literature. First, we aim at quantifying both the fiscal cost and the insurance value of increased UI generosity. The approaches to estimating the insurance value of additional unemployment benefits in the literature can be summarized into two broad strands (many of the papers are summarized in Schmieder and von Wachter, 2016). The traditional "consumption-based" approach involves calculating the drop in consumption levels for the unemployed (e.g. Ganong and Noel, 2019; Ganong et al., 2024; Kolsrud et al., 2018). The second approach to calculating the social value of redistributing to the unemployed uses labor supply or consumption responses to variations in UI or other events in order to infer the importance of liquidity constraints vs. moral hazard (Britto, 2022; Chetty, 2008; Card et al., 2007; Landais, 2015; Landais and Spinnewijn, 2021; Hendren, 2017; Campos et al., 2022). In a seminal paper, Chetty (2008) uses variation in severance payments together with proxy measures of household liquidity constraints. He shows that liquidity-constrained households react much strongly to changes in the benefit level than non-constrained households, implying that the liquidity channel is quantitatively important. We aim to use the quasi-experimental variation in non-contingent payments in Lithuania to quantify the insurance value of additional UI payments.

Second, we add to the literature on the effect of UI changes on re-employment wages, summarized in Le Barbanchon et al. (2024). On the one hand, longer non-employment spells resulting from UI extensions might raise re-employment wages by improving match quality. On the other hand, longer non-employment spells might lead to a deterioration of human capital. The evidence on the effect of UI extensions on reemployment wages is mixed. Nekoei and Weber (2017) find that a benefit extension in Austria slightly increased re-employment wages. Schmieder et al. (2016) find that a PBD extension in Germany reduced re-employment wages, while Huang and Yang (2021) find a zero effect for Taiwan.

Third, a relatively small number of papers study joint increases in both policy parameters. Lalive et al. (2006) study both separate and joint increases in the potential benefit duration and the benefit level in Austria and finds that in one case the effect of a joint increase roughly equals the sum of the effects of separate increases, while in another case the effect of the joint increase is larger than the sum of separate increases. Jessen et al. (2025) study the case of Poland, which offers quasi-experimental variation in both the benefit level and the potential benefit duration. They find that a high potential benefit duration amplifies the effect of increasing the benefit level.

The next section describes the institutional context and the macroeconomic environment.

Section 3 introduces the data and analysis sample. Section 4 outlines the empirical strategy, while section 5 presents the effects of unemployment benefits on benefit receipt, non-employment duration, and wages, respectively. Section 6 reports preliminary evidence on the effect of severance pay on the non-employment duration. Section 7 concludes.

2 Institutional Setting

2.1 Unemployment Insurance and Severance Pay

The UI system. The Lithuanian unemployment insurance (UI) system has been managed by the Social Security Administration since 2012 and applies uniformly throughout the country. To qualify for unemployment benefits (UB), individuals must meet two criteria. First, they must obtain legal unemployed status upon registration with the public employment office. Importantly, unlike in most advanced economies, individuals can obtain unemployment status regardless of whether they were laid off or left their job voluntarily. Second, they must have at least 12 months of social insurance contributions to the system during the past 30 months.[1]

Individuals begin collecting UB only after obtaining unemployment status, which usually occurs eight days after filing a UB claim. However, there are three exceptions to this rule. First, if an employee is fired for cause (e.g., misconduct), they must wait three months after becoming unemployed before they are eligible to receive benefits. Second, if an individual leaves a job while receiving benefits (e.g., for sickness leave), they become eligible for UB only after exhausting those benefits. Third, workers who receive a severance payment upon layoff or compensation as part of a mutual agreement to terminate their contract are eligible for UB only after the number of calendar months covered by this compensation has elapsed. This amount is defined in terms of monthly salaries and is calculated by the Social Security Administration.[2]

Under the current system, individuals whose UB claim is accepted are entitled to nine months of benefits. There are, however, some cases when the duration of benefit receipt may be extended: (1) by two months if the claimant is within five years of retirement, (2) by a maximum of one month to compensate for sick leave before becoming unemployed, and (3) by the length of maternity leave if the claimant was granted maternity leave during the unemployment benefit period. Regarding entitlements, the size of UB payments consists of two components: a fixed component and a variable component. The fixed component is 30% of the monthly minimum wage. The variable component is based on individuals' past insured income and follows a decreasing benefit schedule: 50% of past income in the first three months, 40% in months four through six, and 30% in the last three months.[3] Importantly, total UB entitlements are capped at 75% of the average salary in the two quarters preceding the start of the UB spell.

[1] Contribution months are calculated based on all income subject to social insurance contributions, including salaries, sickness benefits, parental leave periods, as well as periods of collecting unemployment benefits or paying contributions as self-employed individuals.

[2] This regulation was discontinued as of June 16, 2020.

[3] Former insured income is calculated as the average of past insured income (including benefits) over the previous 30 months. Any months with no recorded income or benefits are counted as zero.

The Policy Change. The current UI system is the result of a reform that took effect on July 1, 2017. The law establishing the new system was initially announced on June 21, 2016, and was scheduled to take effect on January 1, 2017. However, on December 20, 2016, the Lithuanian Parliament voted to postpone the reform's implementation by six months, to July 1, 2017. Importantly, the legal framework announced in June 2016 remained unchanged when the postponement was decided. However, just three weeks before the reform was set to take effect, Parliament introduced a substantial amendment that altered the original design. This late revision made the UI system more generous by easing eligibility criteria, extending benefit duration, and increasing benefit levels. Table 1 summarizes the old system along with the initially planned reform and the policy as implemented.[4]

Table 1: Changes in the unemployment insurance system

	Before July 2017	**Planned changed**	**After July 2017**
Eligibility			
	contributed 18 out of last 36 months Registered at employment office or completed compulsory military service or was fired without fault	contributed 12 out of last 24 months Registered at employment office or completed compulsory military service	contributed 12 out of last 30 months Registered at employment office or completed compulsory military service
Duration			
	6 to 9 months months	6 months	9 months
Entitlements			
	UB = C + k×V ≤ 0.7×CYI C = State-supported income V = former insured income k = 0.4 during 1–3 months k = 0.2 during 4–9 months	UB = C + k×V ≤ 0.75×AW C = 0.3×Minimum wage V = former insured income k = 0.5 during 1–2 months k = 0.4 during 3–4 months k = 0.3 during 5–6 months	UB = C + k×V ≤ 0.75×AW C = 0.3×Minimum wage V = former insured income k = 0.5 during 1–3 months k = 0.4 during 4–6 months k = 0.3 during 7–9 months

Notes: CYI refers to the Current Yearly Insured Income set by the Government annually and amounted to 476 euros in 2017, while AW refers to the official average gross monthly wage (including individual enterprises), published by the State Data Agency quarterly, which was 741.2 euros in 2017. The income supported by the State (C) in 2017 corresponded to 102 euros, and the minimum monthly salary in 2017 was set at 380 euros. As of January 1, 2019, the Social Security contribution rates paid by employers and employees were modified, affecting how all wages are declared and the levels of entitlements. The former insured income is calculated as the average wage before registering as unemployed, over 36 months prior to the reform, and 30 months after.

The New Labor Code. The UI system reform was enacted alongside another structural change to labor regulations: the New Labor Code. Originally scheduled to take effect on January 1, 2017, the implementation was postponed to July 1, 2017, and its final provisions were not approved until June 6, 2017. The New Labor Code introduced new conditions regarding remuneration, working time arrangements, contract types, and employee representation within firms. Most importantly for our purposes, it substantially changed employment protection legislation. On the one hand, the advance notice period for dismissing an employee was reduced, as were the associated severance payments. More precisely, advance notice periods were halved, and the severance payment system changed from tenure-specific (with a maximum of six monthly wages) to a flat system (capped at two monthly wages). On the other hand, the reform introduced a new type of employer-initiated separation that increases employer discretion by eliminating

[4]Additional graphical illustrations of the changes in benefit duration and unemployment benefit entitlements induced by the reform are provided in Appendix A (Figures A.1 and A.2).

justification requirements while providing short advance notice (3 days) and severance payments equivalent to the pre-reform maximum. Importantly, this new regulation applies to all existing and new employment relationships, meaning its effects extend beyond post-reform hires. Taken together, these changes, summarized in Table 2, resulted in less stringent employment protection.[5]

Table 2: Changes in employment protection legislation

	Before July 2017	After July 2017
Employer's initiative (w/o employee's fault)		
Advance notice	2 months	1 month (2wk if tenure<1yr)
Severance pay	based on tenure ∈ [1,6]×avg. monthly wage	2×avg. monthly wage (0.5 if tenure<1yr)
Employer's initiative (w employee's fault)		
Advance notice	none	none
Severance pay	none	none
Employer's will		
Advance notice	x	3 working days
Severance pay	x	6×avg. monthly wage
Employee's initiative (non-important reasons)		
Advance notice	14 working days	20 calendar days
Severance pay	none	none
Employee's initiative (important reasons)		
Advance notice	3 working days	5 working days
Severance pay	2×avg. monthly wage	2×avg. monthly wage (1 if tenure<1yr)

Notes: Employees 5 or fewer years shy of retirement age, workers under 18, disabled workers, and employees raising a kid under are entitled to 4 months of advance notice before July 2017 in case of employer-initiated separations without the employee's fault. After 2017, employees who are 5 to 3 years shy of retirement age have 2 months' advance notice; for individuals less than 2 years shy of retirement, workers raising a child under 14 or a disabled child under 18, and disabled workers, the advance notice is 3 months in case of employer-initiated separations without the employee's fault. If tenure is five years or longer, the employee will also be entitled to a long-term service benefit paid by a special state fund, equal to 1 to 3 monthly wages, depending on the length of the employment relationship, for employer-initiated separations without the employee's fault. Important reasons refer to a worker's illness, disability, or other reasons stipulated in the collective agreement of interest.

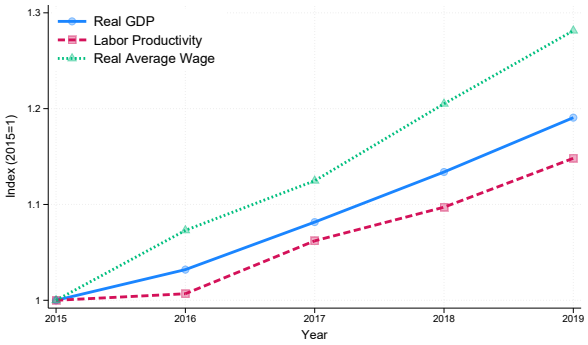
2.2 Macroeconomic context

Figure 1 summarizes the macroeconomic environment surrounding the 2017 unemployment insurance and employment protection reforms in Lithuania over the 2015–2019 period. Panel (a) shows sustained economic expansion: real GDP increased by about 20%, labor productivity rose by about 15%, and real wages grew by almost 30%. Panel (b) documents a steady strengthening of labor market conditions, with declining unemployment, rising vacancy rates, and broadly stable aggregate employment, consistent with productivity gains and a tightening labor market. These trends evolved smoothly throughout the period, with no evidence of macroeconomic instability or abrupt cyclical fluctuations. Panels (c) and (d), instead, highlight how the 2017 reform increased the generosity of the UI system while it decreased the stringency of employment protection legislation. Panel C shows the increase in the generosity of unemployment benefits induced by the reform; following its implementation, Lithuania recorded the second-highest net unemployment replacement rate among OECD countries, exceeded only by Slovenia (as of 2024, Lithuania has the fourth-highest replacement rate). Panel (d) documents a discrete drop in the strictness of employment protection in 2018, following the implementation of the reform in July 2017, after which Lithuania's index remains at a level comparable to the OECD average.

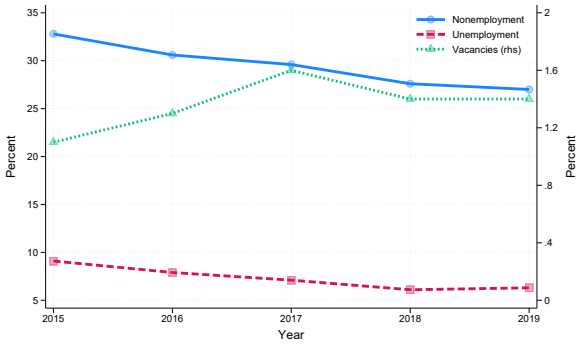
[5] A graphical illustration of severance pay for employer-initiated separations before and after the reform is provided in Appendix A (Appendix Figure A.3).

Figure 1: Macroeconomic developments in Lithuania between 2015 and 2019

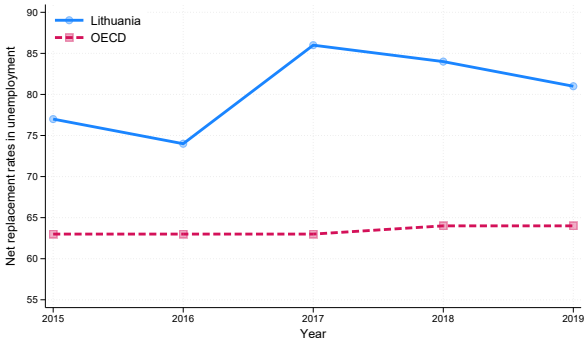
(a) GDP, labor productivity, and wages



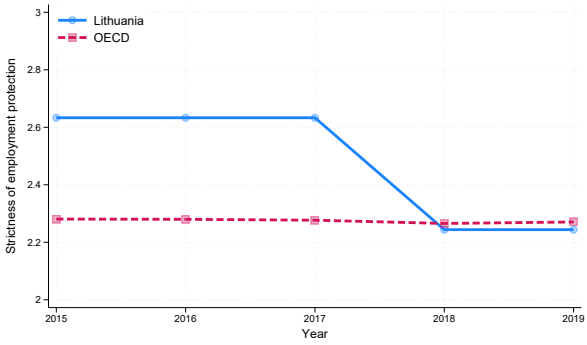
(b) Labor market



(c) Unemployment benefits replacement rates



(d) Strictness of employment protection



Source: Statistics Lithuania, OECD, and own calculations.

Notes: Real GDP, labor productivity (measured as gross value added per worker), and average real wage are normalized to their 2015 levels. Unemployment benefits replacement rates are the percentage of pre-unemployment disposable household income for a single individual with no children during two months of unemployment. Strictness of employment protection measures the regulatory stringency of individual and collective dismissals for workers on regular contracts. The indicator is based on the OECD methodology (Version 4, 2013–2019) and is reported on a 0–6 scale, with higher values indicating stricter employment protection legislation.

3 The Data

Social Security Records. Our main data source is the Lithuanian Social Security Administration registry. The registry contains the records of all citizens registered with the Social Security Administration from January 2010 to December 2024. The dataset includes employees in both the private and public sectors, individuals receiving welfare benefits (e.g., parental, sickness, or unemployment benefits), and retirees receiving pensions. The dataset includes nearly all Lithuanian residents, 2,530,021 individuals, along with unique identifiers as well as demographic characteristics, including date of birth, sex, nationality [6] The register, together with the policy change, is uniquely suited for our purposes as it allows us to examine how unemployment insurance and severance pay shape labor supply decisions and reemployment outcomes within a

[6]Due to legal reasons, individuals do not appear in our sample until they turn 18, even if they were present in the social security system at younger ages.

unified framework.

First, the dataset contains all UB claims from 2012 onward, when the Social Security Administration began managing the unemployment insurance system. For each UB claim, we observe the exact start date of benefit receipt, the legally defined exhaustion date, and the amount of benefits paid each month. This information allows us to calculate *potential benefit duration* (PBD) at the individual level. In addition, the dataset includes complete employment histories between 2010 and 2014, with start and end dates for each registered job.[7] We use these variables to calculate the *effective benefit duration* (EBD), defined as the period between the start date of benefit receipt and the start date of the following registered employment spell. Similarly, we can compute *total non-employment duration* (NED) as the time elapsed between the end date of a job and the start date of the subsequent recorded job spell.

Second, we observe monthly earnings and a rich set of job characteristics for each employment relationship, including occupation, location, and industry. Monthly earnings include all work-related income subject to social security contributions, including base wages and irregular components such as bonuses, allowances, overtime pay, commissions, and severance payments. Exploiting the longitudinal structure of the data, we identify lump-sum payments at job separation. We measure these payments as the difference between earnings in the final month of employment and a counterfactual level of earnings in the absence of severance. The counterfactual is constructed by multiplying daily earnings in the preceding month by the number of days worked in the final month. We compute this measure for jobs lasting at least three months (the probationary period) and consider the difference a separation payment only if the excess exceeds 10 percent of the worker's monthly earnings before separation. While these lump-sum payments may, in some cases, also reflect compensation for unused vacation time, we refer to them as severance pay for simplicity.

Analysis Sample. Our analysis focuses on the period surrounding the July 2017 reform and includes individuals who initiated at least one UB claim between 2015 and 2019 and were aged 18–55 at spell start. We impose two main sample restrictions. First, UB recipients may participate in training programs during which benefit payments are temporarily suspended and later resumed for the remaining entitlement. Because training participation is not observed in the data and induces changes in the benefit exhaustion date that are unrelated to statutory rules, we exclude UB spells exhibiting such changes at spell start (∼2.5% of all UB spells). Second, individuals may engage in short-term, part-time employment while receiving UB without changes to PBD. The job search behavior of these individuals is likely distorted by additional earnings during the UB spell; hence, we remove these spells to obtain a more homogeneous sample and to cleanly identify the effects of extending UB generosity (∼4% of all UB spells). The resulting sample includes 91,359 UB spells starting between 2015 and 2019.

Table 3 reports descriptive statistics for the sample of unemployment benefit (UB) claimants. Claimants are more likely to be women (56%), average 37 years of age, and have approximately one child. About half of the claimants are married, while the rest are divorced (16%) or have

[7] We only consider employment relationships that last at least 15 days. However, we use the entire set of insured records for benefit calculations when needed.

never been married (35%). Before losing their jobs, people in this group typically had worked at their companies for over three years and earned an average of 632 euros a month. About 23% of claimants worked in white-collar occupations, and 37% live in the two largest cities, Vilnius and Kaunas. Most UB claimants previously worked in the private sector; only 9% were employed in the public sector. The majority came from the service sector. Importantly, the sample composition remains stable around the reform date, with no sharp changes in demographics or job characteristics.

Table 3: Descriptive Statistics

	Pre-reform			Post-reform			Total
	2015	2016	2017	2017	2018	2019	
Demographics							
Female	0.55	0.55	0.56	0.57	0.57	0.55	0.56
Age	37.29	37.63	37.84	37.11	37.20	36.95	37.28
Number of children	1.23	1.23	1.22	1.19	1.20	1.16	1.20
Never married	0.35	0.34	0.35	0.37	0.37	0.38	0.36
Married	0.49	0.50	0.48	0.47	0.48	0.47	0.48
Divorced	0.16	0.16	0.16	0.16	0.15	0.15	0.16
Job characteristics							
Duration	31.16	33.75	34.22	31.95	33.19	33.80	32.96
Average income	483.1	535.2	587.6	634.7	700.1	796.6	632.8
White collar	0.20	0.22	0.23	0.24	0.25	0.25	0.23
Vilnius city	0.37	0.36	0.38	0.37	0.38	0.37	0.37
Kaunas city	0.11	0.12	0.12	0.12	0.13	0.13	0.12
Public sector	0.08	0.08	0.08	0.09	0.09	0.09	0.09
Service sector	0.59	0.58	0.58	0.59	0.60	0.58	0.59
Claim characteristics							
Potential benefit duration	6.26	6.28	6.26	9.10	9.04	9.04	7.76
Effective benefit duration	4.16	4.01	3.90	5.37	5.27	5.42	4.75
Non-employment duration	10.07	9.81	9.52	10.05	9.88	10.04	9.93
First UB payment	232.7	252.7	257.6	384.0	408.8	467.8	343.0
Total UB payments	787.6	810.2	839.7	1533.0	1682.2	1980.3	1324.9
Number of UB spells	18,328	16,708	7,227	9,927	19,408	19,761	91,359

Notes: In 2017, the pre-reform period is January 1–June 30, and the post-reform period is July 1–December 31. Average income denotes average monthly income, conditional on job duration of at least 12 months. White-collar occupations are defined as those classified in the first three major groups (1-digit level) of ISCO-08. Vilnius and Kaunas are the two largest cities in Lithuania. The service sector comprises economic activities classified as 48 or higher at the 2-digit level of the NACE Rev. 2 Classification of Economic Activities in the European Community. Potential, effective, and non-employment durations, respectively, are defined in the main text. All durations are expressed in months. Income and UB payments are expressed in nominal terms.

Table 3 also summarizes the changes in benefit generosity before and after the reform. Before the reform, the average potential benefit duration (PBD) was slightly above six months, and the expected benefit duration (EBD) was about four months. Following the reform, the PBD increased to approximately nine months, while the EBD rose to over five months. During this same period, the average non-employment duration (NED) increased from approximately nine

and a half months to ten months. Benefit generosity also increased sharply. The average monthly benefit at the start of a claim rose from 257 euros to 384 euros, corresponding to an increase of roughly one-half. Total unemployment benefit payments increased from 840 euros before the reform to 1,533 euros after the reform. Taken together, these statistics indicate that the reform substantially expanded the duration and level of unemployment benefits.

4 Empirical strategy

We identify the causal effect of the increase in the PBD from 6 to 9 months in July 2017 and the simultaneous increase in the monthly benefit level by 50 percent on labor market outcomes using difference-in-differences (DD) and regression discontinuity (RD). Both approaches rely on the assumption that, conditional on controls, the observed change in average labor market outcomes around the introduction of the reform is caused by the reform.

4.1 Difference-in-Differences

For DD, we restrict the data to spells that start in April through September. For the reform year 2017, we thus have three pre- and three post-reform months. We estimate the equation

$$y_{i,t} = \beta_0 + \beta_1 \mathbf{1}\{\text{month}(t) \geq 7\} + \beta_2 \mathbf{1}\{\text{year}(t) = 2017\} \times \mathbf{1}\{\text{month}(t) \geq 7\} + \boldsymbol{\gamma}_t + \epsilon_{i,t}. \quad (1)$$

$y_{i,t}$ is an individual labor-market outcome of interest, and $\mathbf{1}\{\text{year}(t) = 2017\}$ is a dummy variable that equals 1 if the unemployment spell starts in 2017. $\mathbf{1}\{\text{month}(t) \geq 7\}$ is one if the spell starts in July or later in a given year, and the associated coefficient β_1 captures seasonality.[8] This way of controlling for seasonality is arguably the key advantage of the DD. $\boldsymbol{\gamma}_t$ denotes a full set of year fixed effects and $\epsilon_{i,t}$ is a random disturbance. The coefficient of interest is β_2, the treatment effect of the reform, i.e., the difference in labor market outcomes before and after the reform, net of year and calendar effects. The key identifying assumption of the DD approach is that of common trends: If there had been no reform in July 2017, labor market outcomes in July–September relative to April–June would have been the same in 2017 as in other years.

4.2 Regression Discontinuity

The change in generosity of unemployment insurance in July 2017 creates a sharp discontinuity at the time cutoff. To quantify the effect of the reform, we compare workers just before and after the time cutoff by estimating the following equation using individual-level unemployment spell data:

$$y_{i,t} = \beta_0 + \beta_1 \mathbf{1}\{r_t \geq 0\} + \beta_2 r_t + \beta_3 (r_t \times \mathbf{1}\{r_t \geq 0\}) + \epsilon_{i,t}. \quad (2)$$

[8] A larger share of papers in the UI literature use RD to estimate causal effects. These papers commonly rely on age thresholds for identification such that seasonality is of no concern. In contrast, papers using policy reforms mostly use DD (van Ours and Vodopivec, 2008; Card and Levine, 2000; Lalive et al., 2006).

r_t is the running variable, the start of the unemployment spell centered around July 2017, and $\mathbf{1}\{r_t \geq 0\}$ equals one for spells starting after the implementation of the reform. β_1 is the treatment effect of the reform. The key assumption of RD is that potential outcomes are smooth around the cut-off. This is arguably a stronger assumption than the one underlying the DD approach, which allows us to account for seasonal patterns.

5 Reform Effects on Benefit Duration, Non-employment Duration, and Wages

5.1 Descriptive Evidence

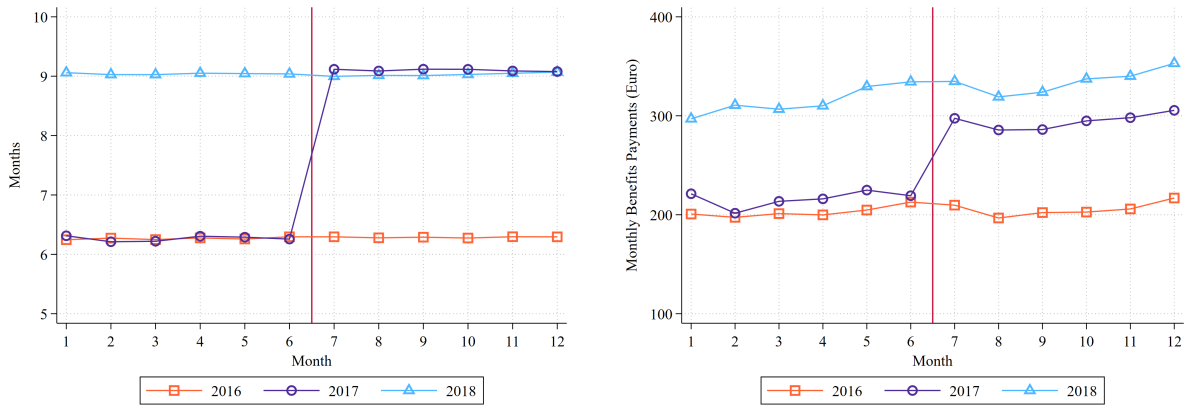
We present descriptive evidence on potential benefit duration (PBD), effective benefit duration (EBD), and total non-employment duration (NED) by month of entry into unemployment for the years 2016–2018. Figure 2, panel (a) shows the average potential benefit duration, i.e., the purely mechanical effect of the reform. In 2016, the average PBD is constant at slightly above six months throughout the year, reflecting the pre-reform statutory rules. As we describe in section 2, before the 2017 reform, the PBD was 6 months for the vast majority of individuals, but those with over 25 contribution years had a longer PBD. In 2017, the PBD increased sharply between June and July, jumping to about nine months for spells starting after the reform. Due to rare exceptions, some individuals' post-reform PBD exceeds 9 months. No such within-year change is visible in either 2016 or 2018, and the PBD is otherwise flat within each year. This confirms that the reform generated a large, mechanically determined, and sharply timed increase in potential benefit duration that is orthogonal to seasonality.

Panel (b) of Figure 2 reports the monthly benefit receipt. While average benefit receipt shows only minor fluctuations throughout the years 2016 and 2018, the 2017 labor market reform led to a pronounced increase in monthly payments from around 200 to 300 Euro per month.

Figure 3, panel (a) reports the average effective benefit duration. Prior to the reform, the EBD was rather stable over the calendar year. In 2017, EBD rises discretely for spells starting in July and later, while no comparable discontinuity appears in 2016. The EBD remains elevated throughout 2018. Although the EBD exhibits modest seasonal variation——somewhat longer durations in spring and perhaps autumn——these patterns are modest and similar across years. The sharp change at the July 2017 cutoff of about 3 months, therefore, suggests a response to the increase in the PBD rather than merely seasonality. Comparing Figures 2 and 3, we see that the effective benefit duration was roughly 2 months below the potential benefit duration before the reform. After the reform, the difference has increased to 3.5-4 months. In panel (b) of Figure 3 we discretize the dependent variable and report the share receiving benefits for more than 6 months. The share is smooth over the years 2016 and 2018, but jumps by around 40 percentage points in 2017.

Figure 4, panel (a) plots the average non-employment duration. NED displays more month-to-month variation than EBD, consistent with seasonal labor demand. Nevertheless, in 2017, the average NED increased for spells starting after July relative to earlier months. This pattern

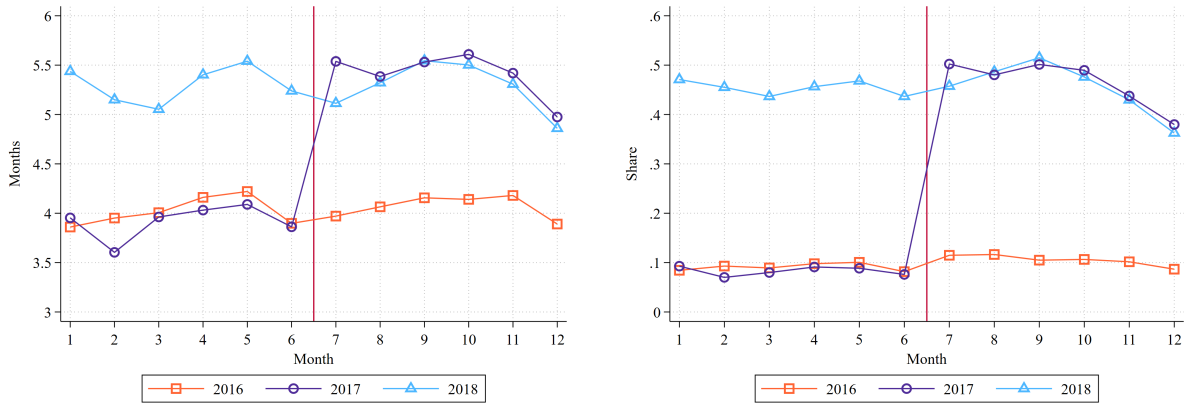
Figure 2: Potential benefit duration and monthly benefits by month of entry into non-employment



(a) Potential Benefit Duration (b) Monthly Benefits

Notes: The figure shows the average potential benefit duration (Panel A) and monthly benefit payments (Panel B) by month of entry into non-employment for the years 2016-2018 for our estimation sample.

Figure 3: Effective benefit duration by month of entry into non-employment



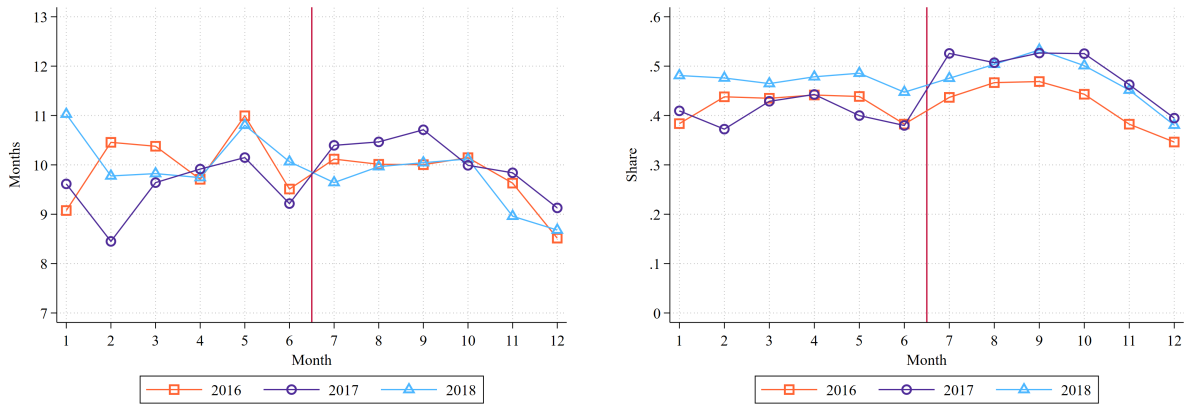
(a) Months (b) Share > 6 months

Notes: The figure shows the average effective benefit duration (panel a) and the share with durations above 6 months (panel b) by month of entry into non-employment for the years 2016-2018 for our estimation sample.

is absent in 2016 and does not repeat in 2018, indicating that it is not driven by recurring seasonal factors. Panel (b) again reports the share in non-employment fore more than six months, which jumps by about 15 percentage points in 2017 around the reform. The increase in NED is qualitatively consistent with longer benefit receipt translating into longer jobless spells. It is substantially smaller than the increase in EBD, suggesting that most of the increase in the effective benefit duration was mechanical. We observe differential patterns in the first quarter of each year that are unlikely to be caused by the reform.

The observed descriptive patterns directly inform our empirical strategy. The absence of within-year discontinuities between June and July outside 2017 generally supports the use of adjacent months in a regression discontinuity design around July 2017, but the visible seasonality

Figure 4: Non-employment duration by month of entry into non-employment



(a) Months (b) Share > 6 months

Notes: The figure shows the average non-employment duration (panel a) and the share with durations above 6 months (panel b) by month of entry into non-employment for the years 2016-2018 for our estimation sample.

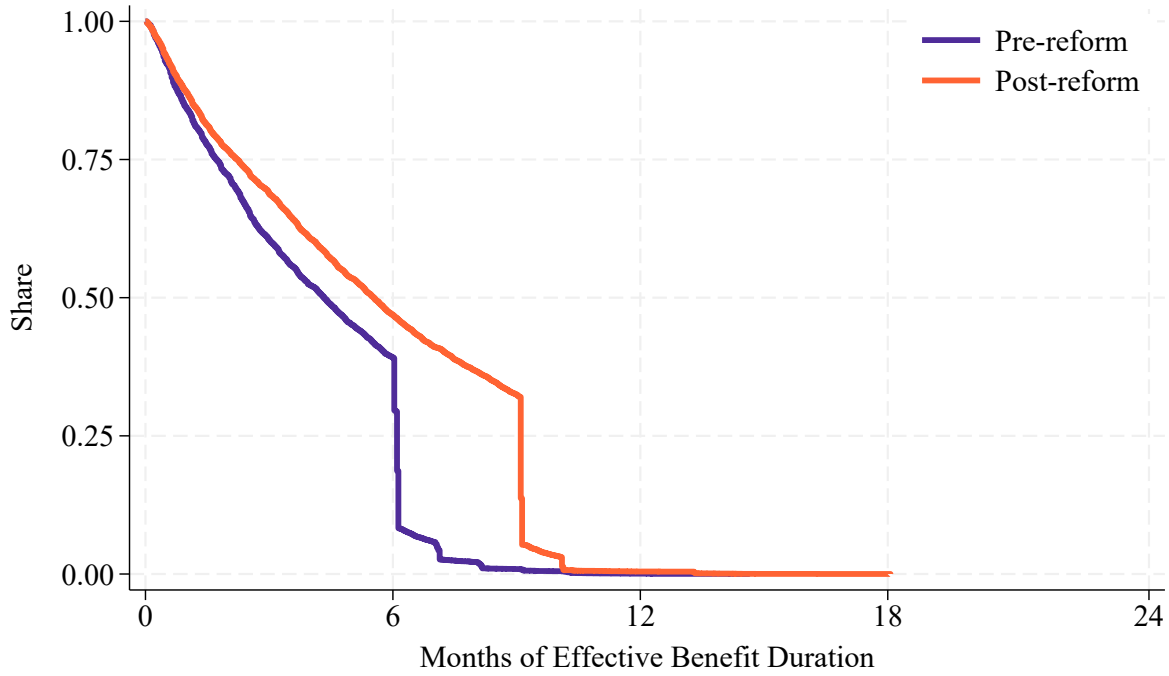
could impede an unbiased estimation of reform effects. The similarity of seasonal profiles across years around the reform month underpins the difference-in-differences approach comparing pre- and post-July spells across calendar years. Due to differential patterns at the beginning of each year, we restrict the estimation sample to spells that start in April through September, unless otherwise stated.

Figures 5 and 6 summarize the effects of the July 2017 reform using Kaplan–Meier survival functions for spells starting before and after the cutoff in 2017. Note that these survival curves are based on the raw data and do not control for seasonality. Hence, they do not yet provide conclusive evidence of the reform's effect. Figure 5 shows a pronounced rightward shift in effective benefit duration. Prior to the reform, benefit receipt drops sharply at six months, reflecting statutory exhaustion under the old rules. After the reform, this mass point shifts to nine months, consistent with the increase in the potential benefit duration. The post-reform survival curve also lies above the pre-reform curve at earlier points in time, indicating higher benefit receipt throughout the spell, i.e., a behavioral adjustment in addition to a mechanical effect that only occurs at exhaustion.

Figure 6 reports analogous survival functions for non-employment duration. In contrast to the effective benefit duration, the difference between the curves does not contain a mechanical effect. Accordingly, differences between pre- and post-reform spells are smaller but remain visible during the first year of non-employment, with post-reform spells lasting longer on average. At longer horizons, the curves converge, suggesting limited effects on the right tail of the non-employment distribution.

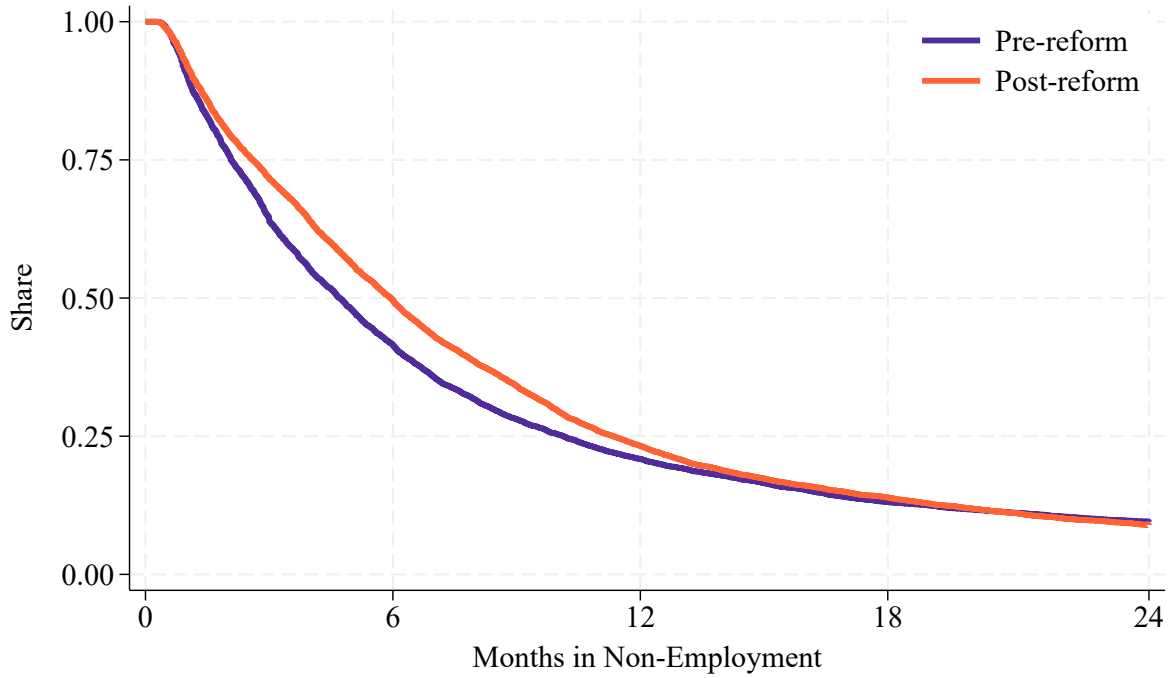
Finally, Figure 7 documents average earnings of individuals who became unemployed between the beginning of 2016 and the end of 2018 in the first full month before becoming unemployed and the first full month after finding a new job after the unemployment spell. The horizontal axis indicates the month of the start of the unemployment spell. Lithuania experienced substantial wage growth in our period of observation. One consequence is that—perhaps surprisingly—wages

Figure 5: Reform effects on benefit durations in 2017



Notes: The figure shows the Kaplan-Meier estimate for the share still receiving benefits at a given point in time after the start of the unemployment spell, separately for spells starting before and after the July 2017 reform.

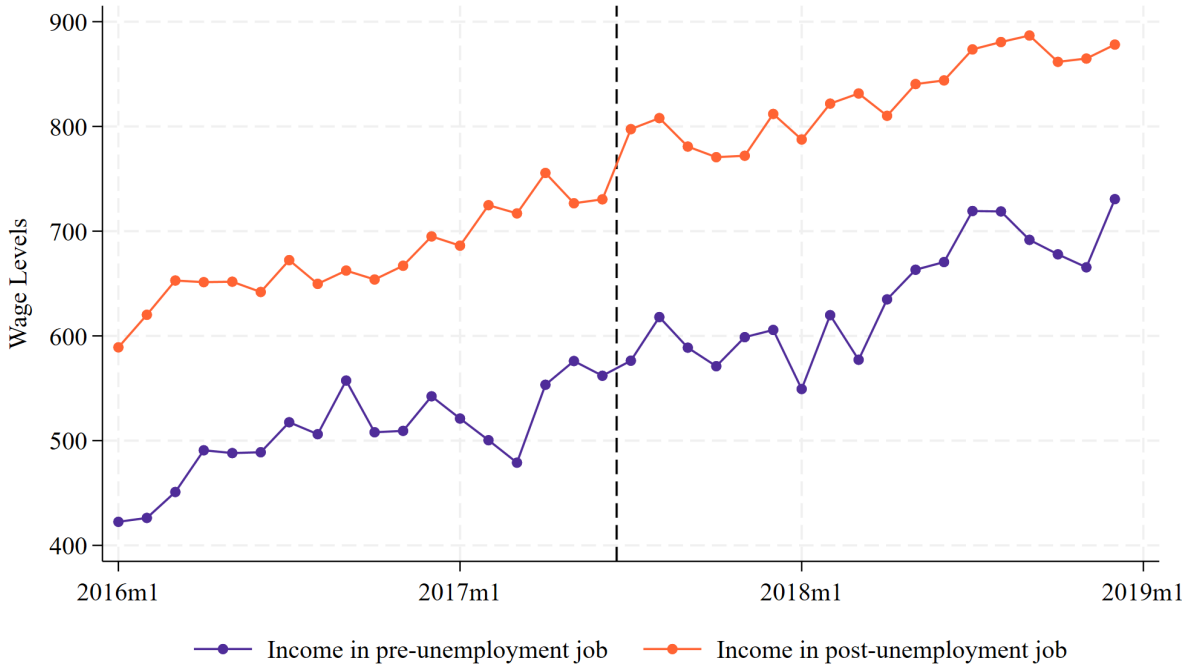
Figure 6: Reform effects on non-employment durations in 2017



Notes: The figure shows the Kaplan-Meier estimate for the share still non-employed at a given point in time after the start of the unemployment spell, separately for spells starting before and after the July 2017 reform.

in post-unemployment jobs on average were substantially higher than those in pre-unemployment jobs. Moreover, potential effects of the reform on post-unemployment earnings would be visible as a discontinuity around July 2017. Such an effect is discernible.

Figure 7: Reform effects on earnings



Notes: The figure shows average nominal monthly earnings in the final full month of employment before becoming unemployed and the first full month of employment after re-employment. The horizontal axis indicates the start of the unemployment spell.

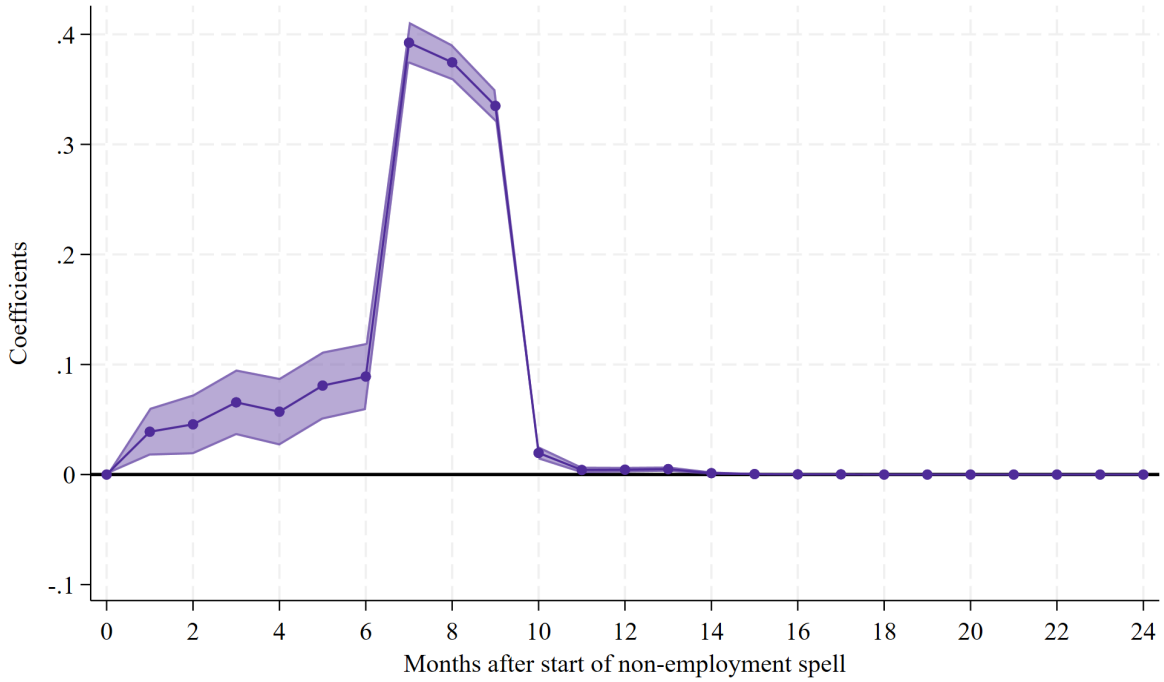
Overall, the figures indicate that the reform substantially increased effective benefit duration and modestly prolonged non-employment spells, with effects concentrated within the benefit entitlement window. These patterns motivate the regression analysis in the next section, which quantifies the magnitude of these effects.

5.2 Estimates

We now quantify the effects of the July 2017 reform on effective benefit duration (EBD) and total non-employment duration (NED) using the difference-in-differences and regression discontinuity designs described in section 4.

Figure 8 reports DD estimates for the probability that a benefit spell lasts longer than a given number of months. It is based on separate monthly regressions. The reform leads to a sharp and precisely estimated increase in benefit receipt at 7 months, just after the pre-reform exhaustion point. The probability of receiving benefits for at least 7 months rises by 35–40 percentage points. The sharp increase at 7 months mostly represents a mechanical effect. Estimated effects before the pre-reform exhaustion point, which are solely due to behavioral adjustments, imply an increase in the probability of receiving benefits of around 5 percentage points. The effect is zero beyond 9 months, consistent with the extension of the statutory entitlement window.

Figure 8: DD estimates on probability benefit spell lasting more than specific numbers of months



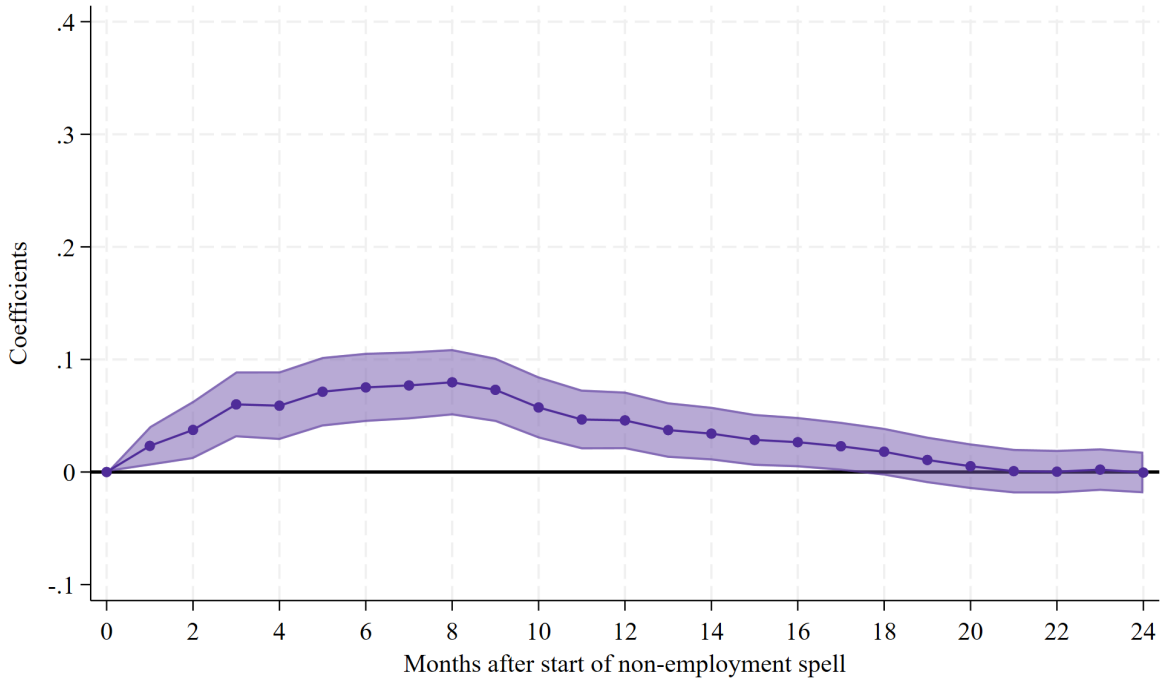
Notes: The figure shows coefficients of difference-in-differences regressions where the dependent variable is a binary that is one if a person still receives benefits after a specific number of months after the start of the non-employment spell. The sample is restricted to spells starting in April-September of each year. The treatment group are spells starting in 2017 and the control group are spells starting in 2016 or 2018. The post-treatment period starts in July each year.

Figure 9 presents analogous estimates for non-employment duration. The reform increases the probability of remaining non-employed at intermediate horizons, with effects peaking around 4 to 9 years after job loss. Since they only represent behavioral adjustments, the effects are substantially smaller than those for benefit receipt. The effect persists after the post-reform benefit exhaustion point at 9 months and declines gradually thereafter, becoming zero at longer horizons.

Table 4 shows estimates for the reform effects on benefit and non-employment durations in levels and logs, summarizing the information contained in Figures 8 and 9. Across specifications, the reform increases effective benefit duration by about 1.5 to 1.8 months or about 0.3 log points. Total non-employment duration rises by 0.8 to 1.5 months or between 0.15 and 0.23 log points. As discussed above, our preferred estimate is DD since it allows us to control for seasonality. Nonetheless, the RD estimates are similar, supporting the validity of both identification strategies.

When interpreting the coefficients, we use the fact that the reform raised both the potential benefit duration and the monthly benefit level by about 50 percent (see Table 3). Elasticities with respect to a simultaneous, proportional increase in these two policy parameters are obtained by dividing the coefficients of the specification in logs by $ln(1.5)$. The elasticity of the effective benefit duration is between 0.7 and 0.8, while that of the non-employment duration is between 0.4

Figure 9: DD estimates on the probability of non-employment lasting more than specific numbers of months



Notes: The figure shows coefficients of difference-in-differences regressions where the dependent variable is a binary that is one if a person is still not employed after a specific number of months after the start of the non-employment spell. The sample is restricted to spells starting in April-September of each year. The treatment group are spells starting in 2017 and the control group are spells starting in 2016 or 2018. The post-treatment period starts in July in each year.

and 0.6, depending on the specification. In a survey of papers that estimate duration elasticities w.r.t. UI changes, Schmieder and von Wachter (2016) report a wide range of elasticities with a median elasticity of the unemployment duration w.r.t the benefit level of 0.53 and w.r.t. the potential benefit duration of 0.40. Given that our estimates reflect reactions to increases in both policy parameters, they are at the lower end compared to previous findings.

Few papers analyze the effects of joint increases in benefit level and potential benefit duration. One is Lalive et al. (2006) on Austria, which studies separately increases in one policy parameter and in two separate instances where both parameters were increased. In one case, the effect of a joint increase on the average unemployment duration is roughly equal to the sum of separate increases of the PBD and the benefit level. However, in the second case, where the PBD is increased from 30 to 52 weeks, the effect of the joint increase is much larger than the sum of the separate increases in the two policy parameters. This limited evidence suggests that the sum of separate increases in the two parameters in Lithuania would not exceed the effect of the joint increase that we analyze. There is also little evidence on the relationship between non-employment duration and the benefit level and potential benefit duration within the same country and group. An exception is Jessen et al. (2025), who find that, for Poland, the elasticities of unemployment duration w.r.t. both parameters are of similar magnitude, about 0.3. Assuming that the elasticities in Lithuania are the same too and that the response to the joint increase is

Table 4: Effects of the July 2017 UI reform on benefit and non-employment durations

Dependent variable in:	Levels				Logs			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Effective Benefit Duration (EBD)								
RD estimate	1.7754***				0.3195***			
	(0.1429)				(0.0522)			
DD Estimate (2016-17)		1.5037***				0.2830***		
		(0.0841)				(0.0324)		
DD Estimate (2017-18)			1.5535***				0.2820***	
			(0.0953)				(0.0326)	
DD Estimate (2016-18)				1.5037***				0.2830***
				(0.0841)				(0.0324)
Observations	8,122	16,143	17,548	25,569	8,101	16,109	17,507	25,515
Panel B: non-employment duration (NED)								
RD estimate	1.4517**				0.2320***			
	(0.6771)				(0.0588)			
DD Estimate (2016-17)		0.8381*				0.1580***		
		(0.4575)				(0.0370)		
DD Estimate (2017-18)			1.1495***				0.1611***	
			(0.4083)				(0.0353)	
DD Estimate (2016-18)				0.8381*				0.1580***
				(0.4575)				(0.0370)
Observations	8,122	16,143	17,548	25,569	8,122	16,143	17,548	25,569

Notes: Panel A reports estimates for effective benefit duration (EBD) and Panel B for total non-employment duration (NED), both measured in months. Columns (1) and (5) report regression discontinuity (RD) estimates comparing spells starting just before and after July 2017. Columns (2)–(4) and (6)–(8) report difference-in-differences (DD) estimates comparing spells starting before and after July 2017 relative to spells before and after July in other years. The sample is restricted to the months April to September. Robust standard errors are reported in parentheses. Significance levels: * < 10% ** < 5% *** < 1%.

simply the sum of responses to separate increases in both parameters, the implied elasticities of non-employment w.r.t. the benefit level and the potential benefit duration are half of that of the elasticity w.r.t. a proportional joint increase, i.e., between 0.2 and 0.3.

For completeness, we also show RD graphs for the PBD, EBD, and NED in Appendix Figures A.4, A.5, and A.6. Moreover, we show figures equivalent to Figures 8 and 9, but with coefficients of a placebo test of the DD for an April reform in Appendix Figures A.7 and A.8. Comfortingly, the figures report precisely estimated zero coefficients.

Finally, Table 5 documents reform effects on the change in earnings between the last full month of employment before becoming unemployed and the first full month of employment after re-employment. The coefficients indicate whether individuals who became unemployed just after the reform had different earnings growth than those who became unemployed just before, controlling for seasonality. We use measures of earnings growth resembling those in Nekoei and Weber (2017). Column (1) reports the effect on the earnings change in percent. The estimate is imprecise and insignificant. Column (2) reports the effect on a dummy of whether post-unemployment wages exceed 80 percent of pre-unemployment wages. This is the case for most individuals due to robust wage growth in Lithuania. The estimate is insignificant. Column (3) reports the effect on the probability that post-unemployment earnings exceed pre-unemployment

earnings. The coefficient implies that becoming unemployed just after the reform raises the probability of enjoying higher earnings after the unemployment spell by 5.5 percentage points. This might be because of improved match quality. Since the reform increased the duration of non-employment, workers might have more time to search for a good match. An alternative explanation might simply be the strong wage growth in the economy. In such circumstances, even holding match quality constant, later re-employment implies a higher wage in the first month in the new job. So far, we consider the evidence on the reform's wage effects inconclusive.

Table 5: Effects of the July 2017 UI reform on earnings

Dependent variable:	earnings change (1)	post> 0.8×pre (2)	post>pre (3)
DD Estimate (2016–18)	58.8021	0.0117	0.0553***
	(46.4592)	(0.0136)	(0.0158)
Observations	16,159	23,025	23,025

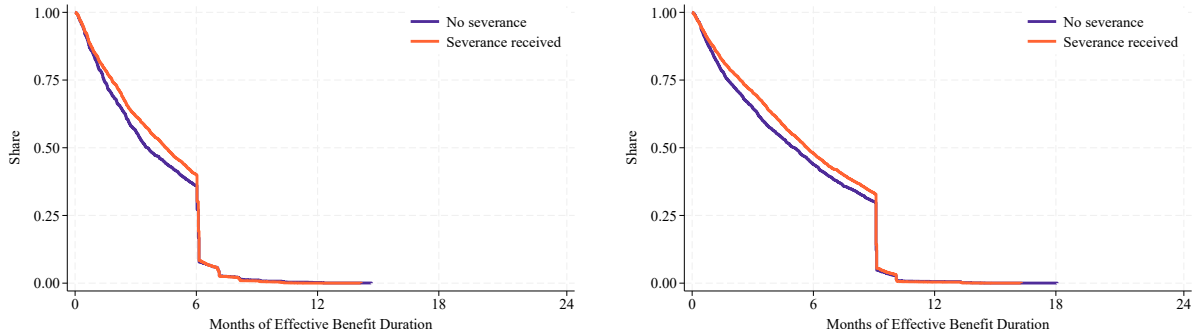
Notes: The table reports DD estimates of the effect of the 2017 reform on measures of the earnings change between the last full month of employment before becoming unemployed and the first full month of employment after re-employment. Column (1) reports the effect on the earnings change in percent, column (2) the effect on a binary that is one if post-unemployment earnings exceed 80 percent of pre-unemployment earnings, and column (3) documents the effect on a binary that is one if post-unemployment earnings exceed pre-unemployment earnings. The sample is restricted to the months April to September. Column (1) has fewer observations because zero pre-unemployment earnings are excluded. Robust standard errors are reported in parentheses. Significance levels: * < 10% ** < 5% *** < 1%.

Having quantified the behavioral reactions to changes in the UI system, which are key for understanding the cost of increasing generosity, we now turn to quantifying the effect of severances on unemployment duration. Since severances do not distort the relative price between leisure and consumption, labor supply reactions to receiving a severance do not reflect moral hazard, but merely a liquidity effect. They are therefore key to understanding the benefits of increased generosity.

6 Effects of Severance Payments on Benefit and Non-employment Duration

Figure 10 reports Kaplan-Meier survival estimates for benefit receipt pre- and post the 2017 reform (subfigures (a) and (b)), separately for individuals who have received a severance payment and for those who have not. Clearly, individuals who have received a severance payment receive benefits for longer on average. Figure 11 is equivalent, but for non-employment. Again, the survival probability of those who have received severance pay is higher than that of those with no severance. Since severance pay affects liquidity without altering the relative prices of consumption and leisure (in contrast to UI), the different durations suggest that liquidity constraints play a significant role for job-seekers. The lines converge at longer time horizons. This is not surprising since the severance pay plausibly affects liquidity mainly in the first few months of unemployment.

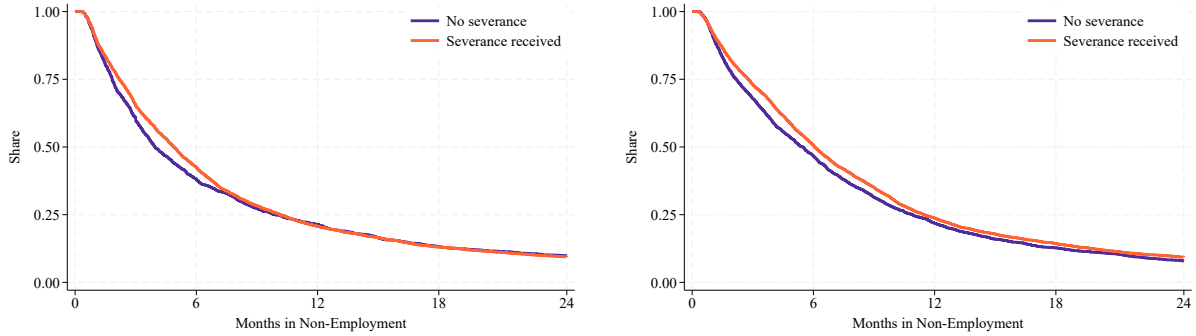
Figure 10: Effects of severance on benefit durations in 2017



(a) Pre-reform (b) Post-reform

Notes: The figure shows the Kaplan-Meier estimate for the share still receiving benefits at a given point in time after the start of the unemployment spell.

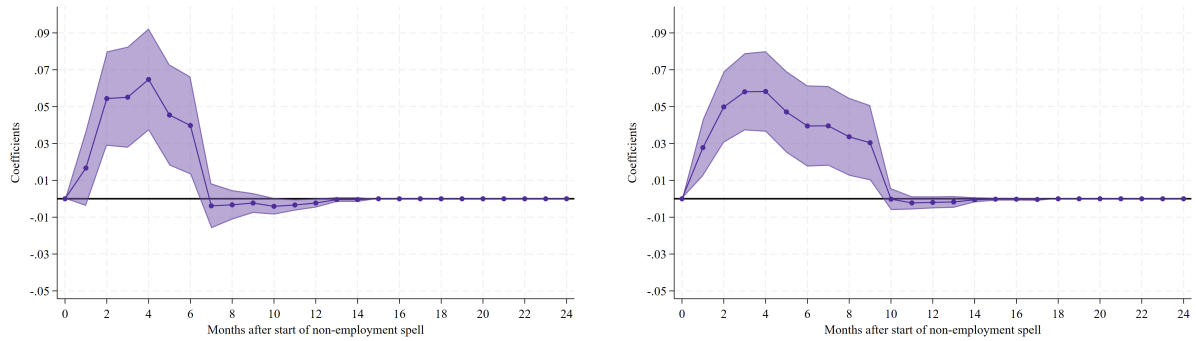
Figure 11: Effects of severance on non-employment durations in 2017



(a) Pre-reform (b) Post-reform

Notes: The figure shows the Kaplan-Meier estimate for the share still non-employed benefits at a given point in time after the start of the unemployment spell.

Figure 12: Estimates of the effect of severance on effective benefit durations pre- and post-reform 2017

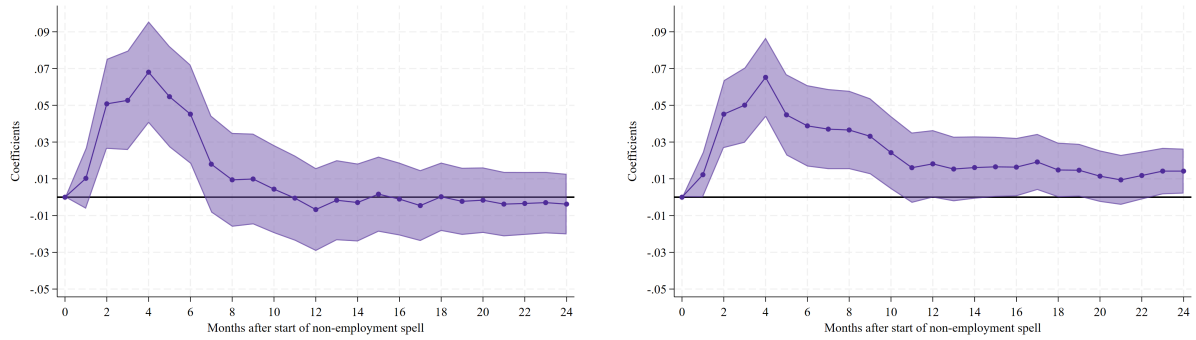


(a) Pre-reform (b) Post-reform

Notes: The figure shows coefficients of regressions where the dependent variable is a binary that is one if a person is receiving benefits after a specific number of months after the start of the non-employment spell, and the independent variable is a binary indicating whether the person received any severance payment.

Figures 12 and 13 show regression coefficients where the dependent variable is a dummy if someone survives in benefit receipt or non-employment after a specific number of months, and the independent variable is a dummy if someone received severance. The graphs thus measure the difference between the survival estimates for severance receivers and non-receivers in the previous figures. For both outcomes, those who received severance pay have a statistically significantly higher probability of survival by about 5 percentage points in the first few months of unemployment. This finding is in line with Chetty (2008), who shows that receivers of severance pay in the US have longer unemployment durations than non-receivers.

Figure 13: Estimates of the effect of severance on non-employment durations pre- and post-reform 2017



(a) Pre-reform

(b) Post-reform

Notes: The figure shows coefficients of regressions where the dependent variable is a binary that is one if a person is still not employed after a specific number of months after the start of the non-employment spell and the independent variable is a binary whether the person received any severance payment.

So far, this is evidence that the effect of severance pay cannot be interpreted as fully conclusive since the variation in severance pay is not guaranteed to be exogenous. Yet, Lithuania offers precisely this kind of variation, so readers should stay tuned for the next update of this paper.

7 Conclusion

This paper studies the labor market effects of a comprehensive reform to unemployment insurance and employment protection in Lithuania in July 2017. By simultaneously increasing UI generosity and reducing firing costs, the reform offers a rare opportunity to evaluate a shift toward flexicurity within a single institutional environment.

Using administrative data and quasi-experimental variation, we document three main findings. First, extending the potential benefit duration and increasing benefit levels substantially increased both the effective benefit duration and the non-employment duration, implying a substantial fiscal externality of the reform. Second, severance payments — which relax liquidity constraints without distorting incentives — also prolong non-employment spells. Third, we find no conclusive evidence that the reform adversely affected post-unemployment wages.

These results have several implications. First, they confirm that the fiscal cost of increasing

UI generosity exceeds the direct insurance cost by a considerable margin. Second, even in a high-replacement-rate system like Lithuania's, further increases in benefit generosity might still provide valuable additional insurance.

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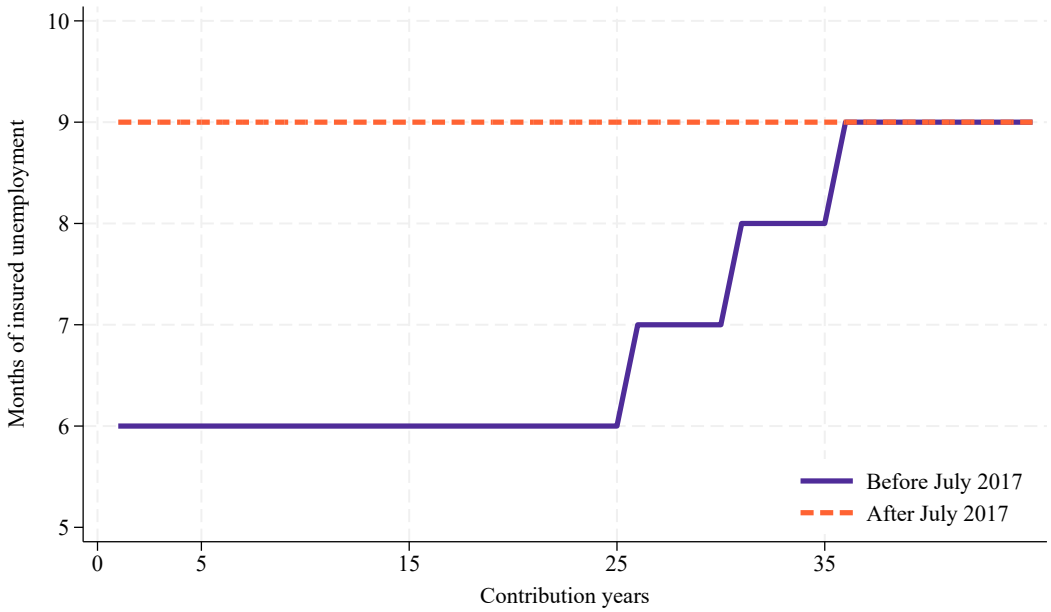
APPENDIX (FOR ONLINE PUBLICATION)

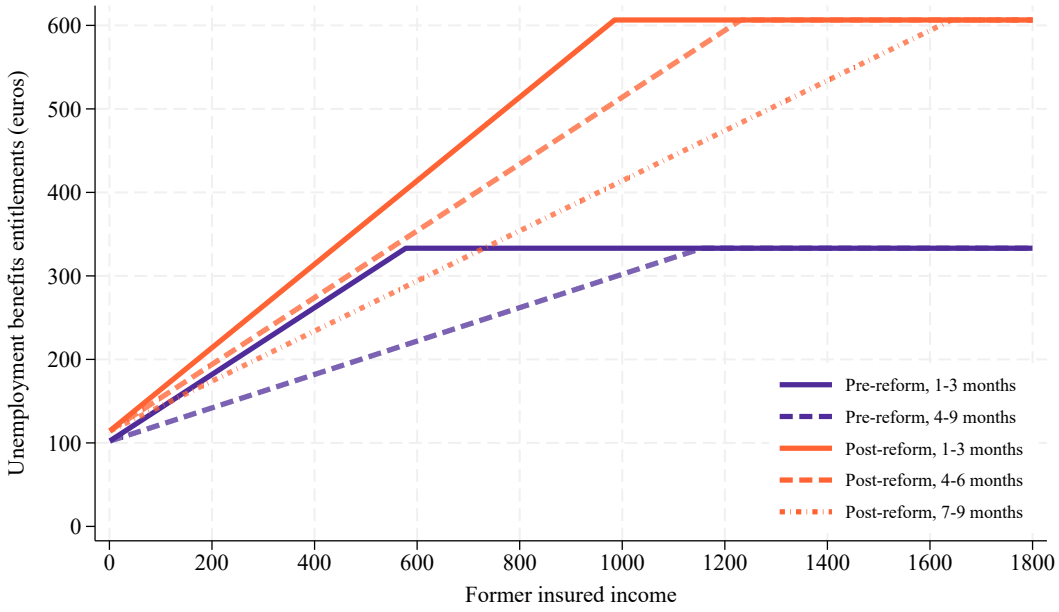
A Additional Figures

Figure A.1: Potential benefits duration, before and after the reform



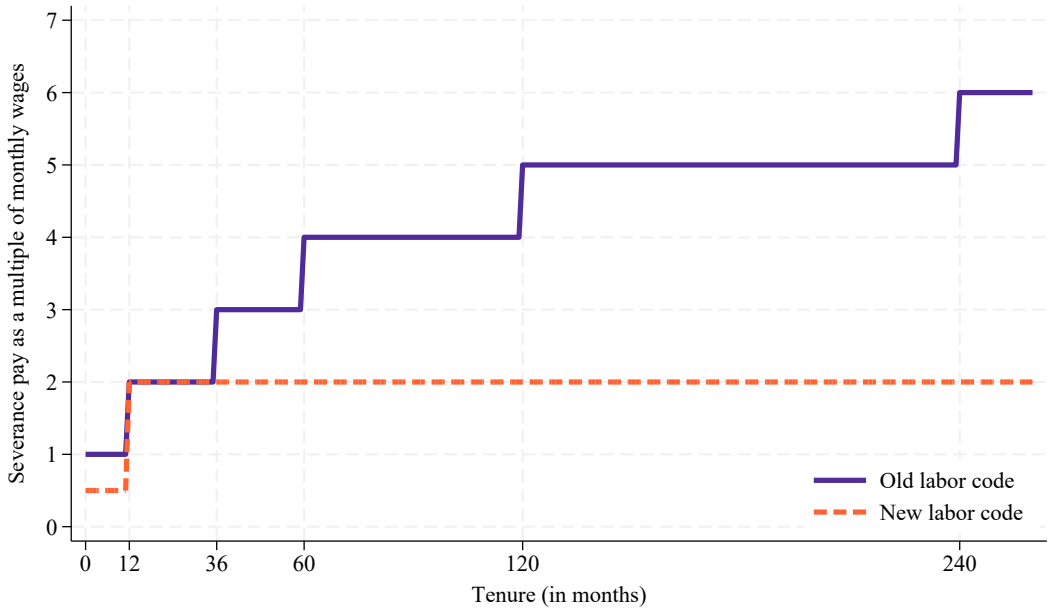
Notes: The figure shows potential unemployment benefits duration by contribution years to social security before and after the policy change of July 2017.

Figure A.2: Unemployment benefits entitlements, before and after the reform



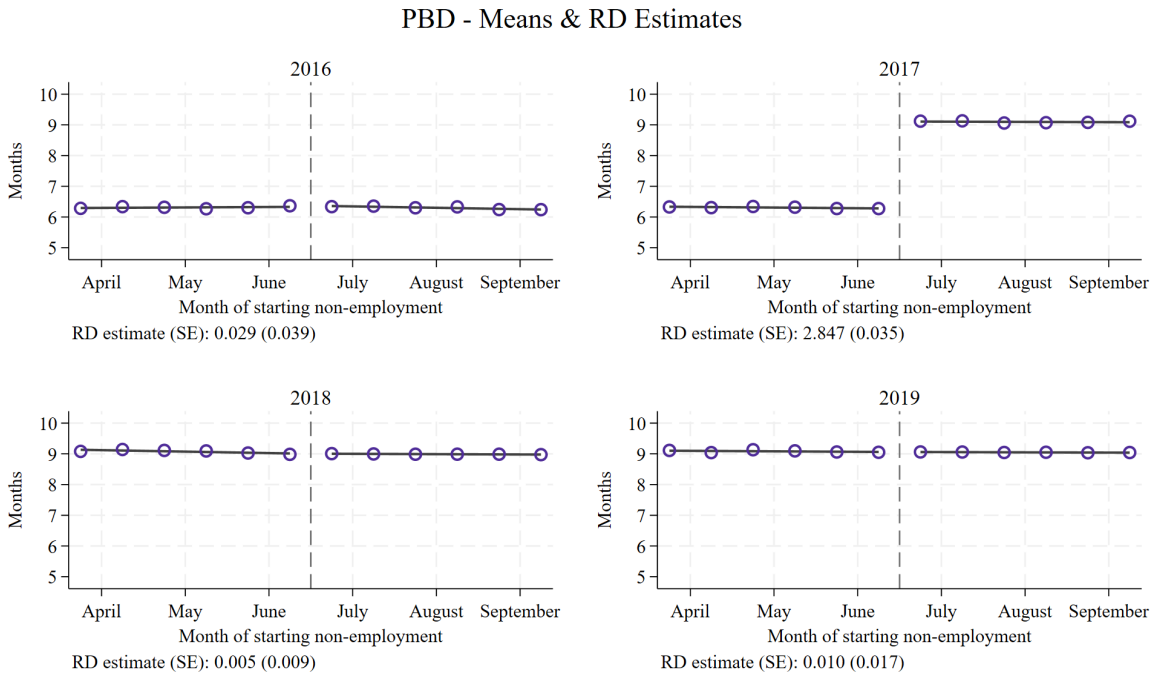
Notes: The figure shows unemployment benefits' entitlements before and after the July 2017 policy change and for different durations by hypothetical previous insured earnings. The upper limits of pre-reform and post-reform entitlements refer to the values of CYI and average monthly earnings in 2017, respectively. See Table 1 for more details on the entitlements formula.

Figure A.3: Severance pay for employer-initiated separations, before and after the reform



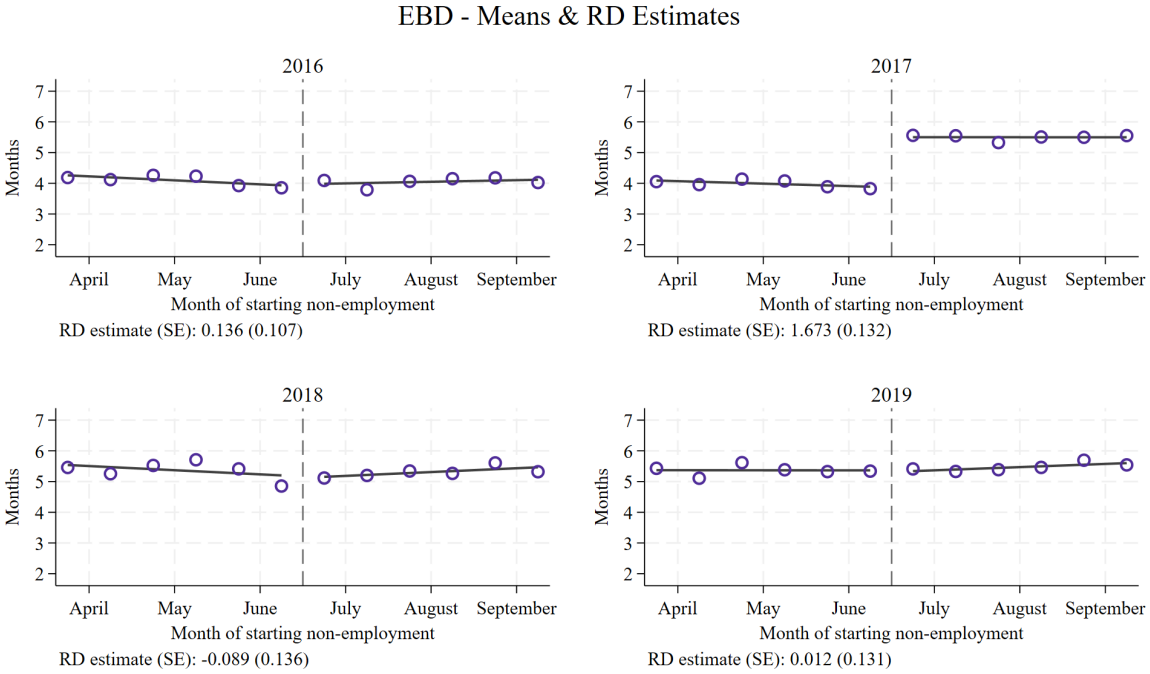
Notes: The figure shows the generosity of severance payments over tenure profiles for separations initiated by the employer not due to employee's misbehavior according to the old labor code (before July 2017) and the new labor code (after July 2017). The generosity of severance pay is based on the average monthly remuneration over the employment spell.

Figure A.4: RD plots of the potential benefit duration in various years



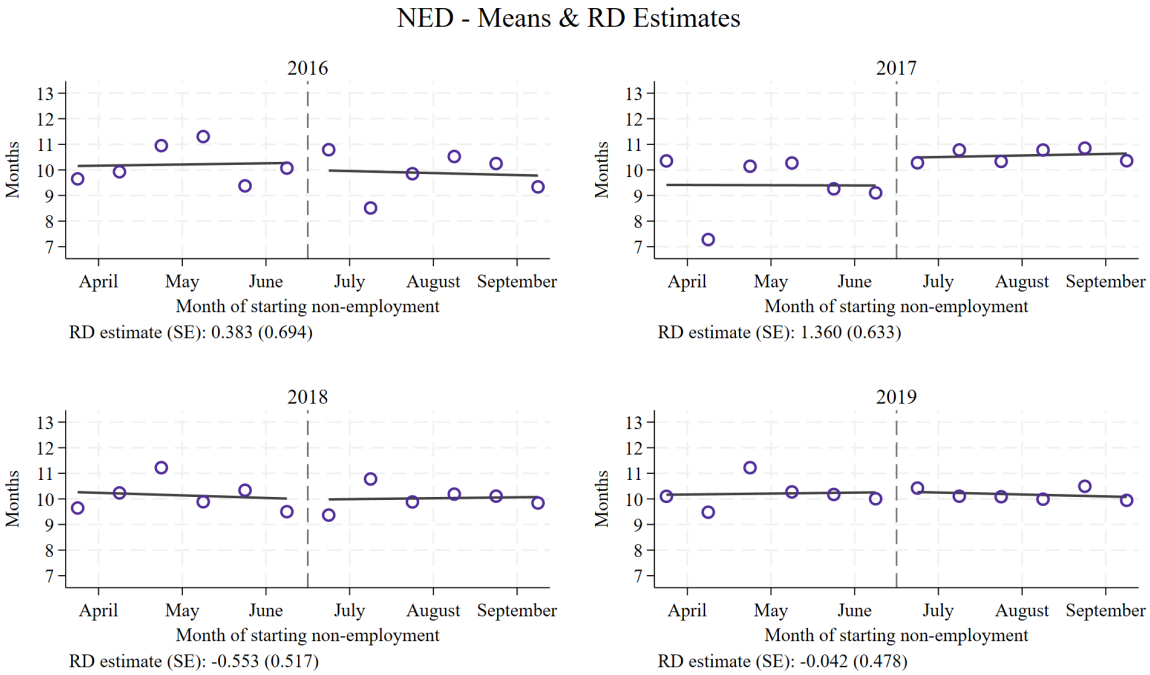
Notes: The figure shows the potential effective benefit duration by month of entry into non-employment for the years 2016-2019 for our estimation sample and the RD estimate, where the running variable is the month of the start of non-employment and the discontinuity is between June and July.

Figure A.5: RD plots of the effective benefit duration in various years



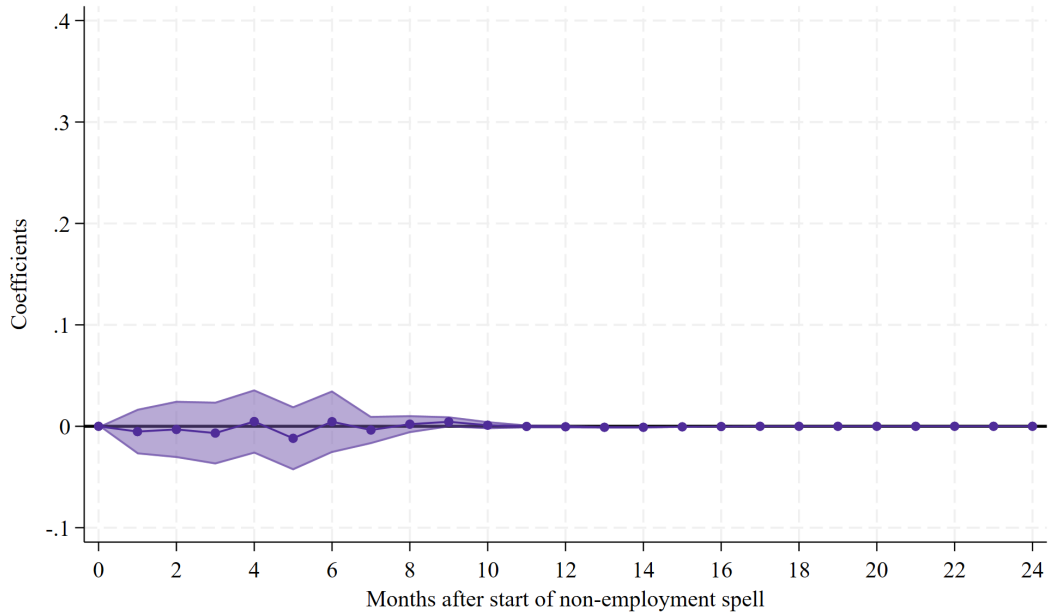
Notes: The figure shows the average effective benefit duration by month of entry into non-employment for the years 2016-2019 for our estimation sample and the RD estimate, where the running variable is the month of the start of non-employment and the discontinuity is between June and July.

Figure A.6: RD plots of non-employment duration in various years



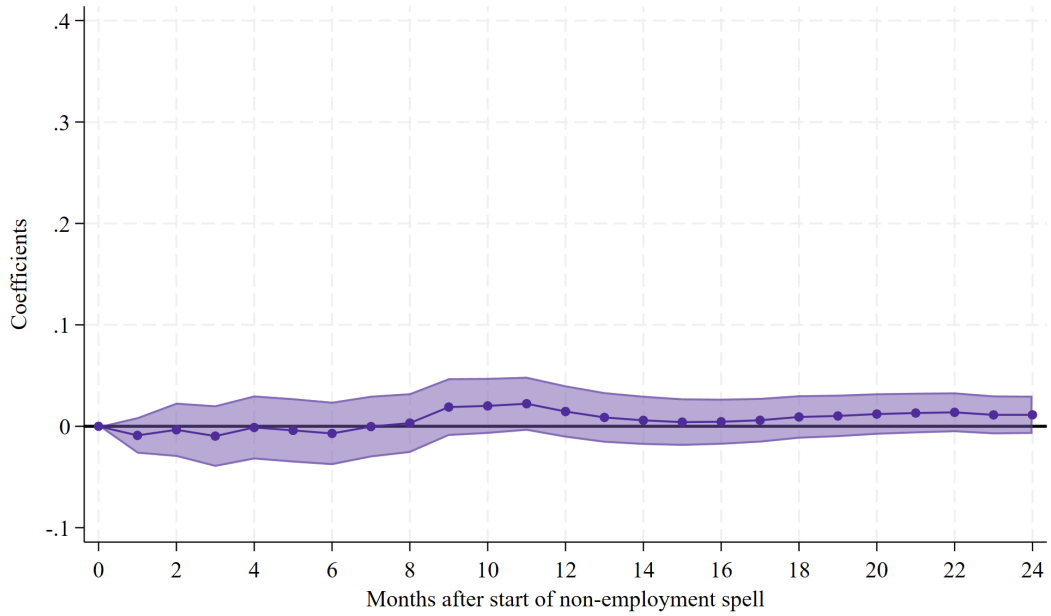
Notes: The figure shows the average non-employment duration by month of entry into non-employment for the years 2016-2019 for our estimation sample and the RD estimate, where the running variable is the month of the start of non-employment and the discontinuity is between June and July.

Figure A.7: Placebo DD estimates on the probability of receiving benefits in specific months after job loss



Notes: The figure shows coefficients of difference-in-differences regressions where the dependent variable is a binary that is one if a person still receives benefits after a specific number of months after the start of the non-employment spell. The sample is restricted to spells starting in the six months of each year. The treatment group are spells starting in 2017 and the control group are spells starting in 2016 or 2018. The placebo post-treatment period starts in April in each year.

Figure A.8: Placebo DD estimates on probability of non-employment in specific months after job loss



Notes: The figure shows coefficients of difference-in-differences regressions where the dependent variable is a binary that is one if a person is still not employed after a specific number of months after the start of the non-employment spell. The sample is restricted to spells starting in the six months of each year. The treatment group are spells starting in 2017 and the control group are spells starting in 2016 or 2018. The placebo post-treatment period starts in April in each year.