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Does cutting the value of unemployment insurance benefits affect take-up? Evidence from Hungary

MÁRTON CSILLAG – BALÁZS MUNKÁCSY – ÁGOTA SCHARLE

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ABSTRACT
Does a drastic cut in in potential benefit duration affect the take-up of unemployment insurance benefits among those eligible? We evaluate a policy change reducing the maximum length of UI benefits from 9 to 3 months in Hungary at the end of 2011. We rely on rich longitudinal matched administrative data, which allows us to obtain information on a large sample of job losers, and precisely estimate eligibility for UI benefits. We find that slightly less than 60 percent of UI eligible individuals claim benefits, and that while the length of benefit entitlement is only slightly positively correlated with taking up benefits, UI claiming rate tends to increase with previous earnings. We show that the proportion of UI benefit claims fell only slightly (by 1.5 – 2 percentage points), but this effect was more pronounced for those with the largest potential losses in UI value. This moderate effect might be related to the fact that the reform essentially got rid of the period of flat-rate UI benefits, while keeping the period when UI benefits were proportional to previous earnings roughly unchanged. At the same time, UI take-up decreased among those with low earnings (around the minimum wage) but stable employment, a group with likely little savings, which is alarming from a social policy perspective.

JEL codes: J64, J65
Keywords: unemployment insurance benefits; potential benefit duration; take-up

Márton Csillag
Budapest Institute for Policy Analysis
and Institute of Economics (KRTK)
marton.csillag@budapestinstitute.eu

Ágota Scharle
Budapest Institute for Policy Analysis
agota.scharle@budapestinstitute.eu

Balázs Munkácsy
Budapest Institute for Policy Analysis
balazs.munkacsy@budapestinstitute.eu

Ha a munkanélküli ellátás értékét csökkentik, akkor kevesebben veszik-e igénybe azt? Eredmények egy hazai reform kapcsán

CSILLAG MÁRTON – MUNKÁCSY BALÁZS – SCHARLE ÁGOTA

ÖSSZEFOGLALÓ

Ha a munkanélküli ellátás potenciális hosszát radikálisan visszavágják, kevesebben veszik-e igénybe a biztosított munkanélküli járadékot az arra jogosultak közül? Egy olyan reform kapcsán értékeljük ezt, amely az álláskeresési járadék maximális hosszát 9 hónapról 3 hónapra csökkentette 2011 szeptemberében Magyarországon. Igen gazdag, longitudinális adminisztratív kapcsolt adatokra építünk, így igen pontos munkatörténetek alapján tudjuk rekonstruálni a járadék jogosultságot, illetve az igénybevételt. Azt találtuk, hogy a jogosultak kevesebb, mint 60 százaléka veszi igénybe a járadékot. Míg a jogosultság maximális hossza csak igen enyhén növeli a járadék igénybevételét, addig a korábbi keresetekkel jelentősen növekszik a járadékért folyamodók aránya. A reform hatására csak igen kis mértékben (1.5-2 százalékponttal) csökkent az igénybevétel valószínűsége, és ez azokra korlátozódott, akiknek körében a járadék értéke a legnagyobb mértékben csökkent. Azt, hogy az igénybevétel csak kevéssé esett vissza, magyarázhatja, hogy azon napok száma, amikor a járadék jövedelem-arányos volt, lényegében nem csökkent, csak a fix összeget fizető járadékos napokat törölték el. Ugyanakkor, az, hogy a járadék igénybevétele különösen az alacsony keresetű (a minimálbér környékén kereső), de stabil munkaviszonnyal rendelkező egyének körében csökkent, akiknek feltehetően kevéssé voltak megtakarításaik, a hazai szociálpolitika szemszögéből nézve igen szomorú.

JEL: J64; J65

Kulcsszavak: biztosítási alapú álláskeresési ellátás; jogosultság hossza; segélyek igénybevétele

Does cutting the value of unemployment insurance benefits affect take-up? Evidence from Hungary[1]

Márton Csillag[2], Balázs Munkácsy, Ágota Scharle

Abstract

Does a drastic cut in in potential benefit duration affect the take-up of unemployment insurance benefits among those eligible? We evaluate a policy change reducing the maximum length of UI benefits from 9 to 3 months in Hungary at the end of 2011. We rely on rich longitudinal matched administrative data, which allows us to obtain information on a large sample of job losers eligible for UI benefits. We find that slightly less than 60 percent of UI eligible individuals claim benefits, and that while the length of benefit entitlement is only slightly positively correlated with taking up benefits, UI claiming rate tends to increase with previous earnings. We show that the proportion of UI benefit claims fell only slightly (by 1.5 – 2 percentage points), but this effect was more pronounced for those with the largest potential losses in UI value. This moderate effect might be related to the fact that the reform essentially got rid of the period of flat-rate UI benefits, while keeping the period when UI benefits were proportional to previous earnings roughly unchanged. At the same time, UI take-up decreased among those with low earnings (around the minimum wage) but stable employment, a group with likely little savings, which is alarming from a social policy perspective.

[1] We thank the Databank of the Centre for Economic and Regional Studies for access to the data used here; Zsuzsanna Sinka-Grósz and Melinda Tir for their advice on using the data. We also thank Bori Greskovics for expert research assistance, as well as the participants of the HUN-REN Institute of Economics Labour Market and Education group seminar for comments. The financial support from the research grant OTKA 135962 is gratefully acknowledged.
[2] Corresponding author. Budapest Institute for Policy Analysis and Institute of Economics (HUN-REN). Email: marton.csillag@budapestinstitute.eu

Introduction

The fact that many of those eligible for social benefits do not claim them is a widely known and studied phenomenon, however, much less is known UI benefits. The Great Recession and the rise of long-term unemployment in its wake has once again directed attention on the design of unemployment insurance benefit systems. An often neglected phenomenon when analysing the incentive effect of UI benefits is the propensity to claim benefits – which is related to the generosity of benefits. This however is important from a scientific point of view since if one does not take into account that decreased generosity can substantially alter the number and pool of UI claimants, one is likely to underestimate the incentive effect of results due to this selection. The effect of a drastic UI cut on non-employed welfare might also be exacerbated if for a large portion of eligible persons, the costs associated with claiming exceed the value of UI benefits. However, claiming costs might not be the right tool to screen those most in need of UI benefits, as those who do not face such high costs might also be those who find jobs relatively easily.

We evaluate the effect of the value of UI benefits on take-up, using a drastic cut in the unemployment insurance benefits which happened in 2011 in Hungary, when the maximum length of entitlement was slashed from 9 to 3 months. There are two important aspects that is worth noting. On the one hand, prior to the cut in potential duration of benefits, the UI scheme was composed of first tier benefit which was proportional to previous earnings (which lasted at most three months) and a second tier which was a fixed (low) rate. The benefit reform effectively slashed the second tier benefits. On the other hand, that the reform not only meant that an individual had to accumulate 10 days of employment to qualify for 1 day of UI benefits; but introduced the 3-month maximum rule. This has the following implications. First, that the subjective value of UI benefits for those who expected to be re-employed quickly did not fall by as much as for those who expected a long spell of non-employment. Second, the fall in the value of UI benefits was particularly large for those with very stable employment. Third, the fall in value of UI benefits relative to prior earnings was less severe for high wage individuals. We leverage these last two results to estimate the effect of the drop in the value of UI benefits on UI benefit take-up.

The reform was discussed for a considerable time before its introduction, and it was voted in parliament seven weeks prior to it taking effect. An important point of the Hungarian system is that the UI benefit scheme which applies to a given UI spell is related to the day on which the UI benefit claim is made, and not to the last day of employment. Thus, a number of persons the value of UI benefits could drop if they waited too long to file their benefit claim. This could be related to high frictions in claiming benefits or lack of information on the severity of the reform. We also use this timing to shed light on factors determining claiming frictions.

Changes in the unemployment benefit policy in Hungary

In Hungary, the unemployment benefit scheme is traditionally not very generous. In 2010, the net replacement rate of unemployment benefit (defined as the ratio of an average production worker's net benefit during the first month of unemployment to their previous net monthly wage) was around 41% according to Esser et al. (2013). This number was the 6th lowest in the European Union where two-thirds of members states had 50% net replacement rates or above, and close to half of them had 60% or above. This was primarily due to a low benefit cap in Hungary: daily benefit was calculated as

60% of mean daily earnings from the last four quarters before job loss with a maximum amount of 1.2 times the minimum wage. [3]

During the period between 2005 June 1st and 2011 August 31st, the UI benefit system worked as follows. First, the number of eligible base days (working days) were converted with a 5:1 ratio (thus 5 eligibility base days[5] counted for 1 UI benefit day); with the maximum benefit duration being 270 days. The base eligibility period was four years, and the minimum number of insured days to qualify for UI benefit was 365. Second, there were two periods of UI benefits, a first one, proportional to pervious earnings, and a second one, with flat-rate benefits – the unemployment assistance. The first period was equal to half potential duration of benefits (or PBD henceforth), with a maximum of 91 days, and the daily benefit amounted to 60% of earnings from the previous year. The second period ('unemployment assistance' for the remainder of the potential benefit duration) paid a flat-rate set at 60% of the minimum wage in 2011.[4]

In 2012, the Hungarian government decided to cut the unemployment benefit even further. It was a complicated reform which, at its core, introduced four changes to the regulation, with the most significant changes affecting the length of the potential duration of UI benefits. First, for each day of benefit, the number of required eligibility base days[5] were doubled, thus 10 working days make the beneficiary eligible for 1 day of benefit. Second, the maximum number of benefit days dropped to 90 from 270 during the reform, and the flat-rate benefit period (the unemployment assistance) was abolished.[6] Third, the base period for eligibility shrank to 3 years from 4 years before, with a 360 minimum insured days for qualification. This meant that after the reform people who worked consistently years ago but started working more erratically in the recent past had a lower chance of eligibility for unemployment benefit.

In contrast to the changes to the potential benefit duration, the daily benefit amount was modified only slightly. Specifically, the daily benefit cap changed from 1.2 times the minimum wage to the amount of the minimum wage. Note however, that the nominal maximum daily benefit did not change significantly from 2011 to 2012, as the reform was accompanied by a substantial, 119.2% increase to the minimum wage. All other rules regarding the calculation of daily benefits were unchanged. It is based on daily earnings during the last four calendar quarters (prior to the initiation of the UI benefit claim), where total monthly earnings were divided by the number of days employed.

[3] This has been the case ever since the UI benefit system has been instated with the fall of communism. See Micklewright – Nagy (1994).

[4] There were a few other features of the benefit system which are worth noting. (1) The reference date for calculating UI benefits was the day when the jobless individual registered as unemployed. (2) Voluntary quits entailed a waiting period of 90 days. (3) If a person was on UI benefits during the base eligibility period, these days were not directly subtracted from the potential benefit duration, rather they were subtracted from the eligible base days (with 1 day of UI = 5 insured days). (4) There was a re-employment bonus scheme was in place with a bonus amount equal to 50% of the remaining total first-tier benefits, if the individual found a job on her own. However, this meant that if the bonus was claimed, all remaining benefit days were annulled.

[5] Essentially, these are days when the individual was insured. There are some complications, however. First, days when was on long-term sick leave (a) do not count as base days, but (b) the extend the base period for calculating eligibility. Second, days when the individual did not receive pay (due to missing work, for workplace temporary shutdown, for unpaid leave) do not count towards base days.

[6] Note that a means-tested minimum income benefit still existed, eligibility however was set at a very low threshold.

The daily UI benefit is equal to 60% of the daily earnings in this base period, with no (daily) minimum, but a very low daily maximum (as highlighted above).

Another channel through which the reform impacted people is the reduction in the base period. The new regulation looks back only on 3 years of job history (instead of 4) to determine the number of benefit days the jobseeker is eligible for. 7.7% of our sample lost at least two days of benefit due to this change in 2012 (30% of those who were eligible for less than the maximum days). [7]

This already complex reform was further complicated by a regulatory mistake. Most of the new rules were implemented in September 2011 except for the reduced base period, which was instead increased to 5 years in September, only to be reduced to 3 years four months later in January. This lead to an intermittent period in the last four months of 2011 where most of the reform was implemented (cutting the benefits of most people). Besides the straightforward consequence that more people were eligible to UI benefits due to the extended base period (during September-December 2011), the modification of the law gave an opportunity to game the UI benefit system. This was specifically possible for those with long stable unemployment histories, due to the fact that past receipt of UI benefits is not subtracted from current UI benefit entitlement days, rather it is subtracted from eligible base days. More specifically, it was possible to receive UI benefits in the Fall of 2011 based on working days from year t-5 and t-4; de-register and re-register (and claim UI benefits) in the beginning of 2012. In that period, the individual could use eligible days from years t-3 to t-1. For this reason, we decided to only include people in our sample if they spent their last year working.

Literature review

The take-up of UI benefits has been rarely studied until recently. It is however relevant for our paper for a number of reasons.[8] First of all, studying UI take-up is relevant if one is interested in the inequality-reducing effect of UI benefits: in principle, it is those who need the benefit the least who will choose to not apply for them; however, this is not necessarily always the case. Second, changes in benefit generosity can lead to shifts in number and composition of recipients, and changes in composition can be due to both observable and unobservable characteristics, which in turn can bias estimates of the effect of UI generosity on job finding rates.

The early literature on the take-up of UI benefits used survey data (see Wandner-Stettner (2000)) to point out two important phenomena in the US. First, that slightly over half of those who do not apply for UI (erroneously) believe that they are not eligible for UI. Second, that a non-negligible proportion of non-employed give the expectation to find a job quickly (possibly at the previous employer) as a reason for not filing. In fact, this proportion is higher than those who give a response related to the (psychological) cost of filing for UI benefits. Using the introduction of phone-based and internet-based UI filing, Ebenstein-Stange (2010) do not find evidence which support the notion that it is time costs which limit the take-up of UI benefits.

[7] On average, they lost 13 days of benefit due to this change in regulation alone.

[8] Economic literature on benefit take-up originates back to the classic paper of Moffitt (1983) on the (means-tested) AFDC. He models the take-up decision as a function of 'welfare stigma,' and potential welfare benefits, calling attention to the fact that welfare participants are a selected sample: either with low 'tastes for work, or low levels of 'stigma'. He estimates welfare take-up, and labour supply simultaneously, and finds that the 'stigma' effect is flat (not proportional to the amount of benefit, that is) and the elasticity of take-up to benefit size is about 0.6.

Anderson-Meyer (2007) use the change in the taxation of UI benefits in 1982, as the threshold for taxable income became much lower, and the after-tax value of UI benefits decreased substantially. Their main results imply that a 10 percent increase in benefits imply a 2-2.5 percentage point higher take-up rate, while a 10 percent increase in PBD imply a 0.5-1 percentage point higher one. In a related paper, Meyer-Mok (2007) build a simple model to study the effect of different parameters of UI benefit design on the take-up decision. They show that UI benefits as well as potential benefits duration increases take-up rate; however, the latter ought to have a smaller effect that than the former, unless everybody believes that they will unemployed for at least as long as the PBD. Changes in different parameters also change the composition of those on benefit in terms of expected unemployment duration; and decreased benefit generosity does not necessarily mean that „new" non-claimants will have shorter (expected) duration than claimants (on average).

Blasco-Fontaine (2021) simultaneously estimate take-up and job finding using administrative data from France. Not only do they model 'fixed costs' but they account for 'frictions' (transaction costs) as well, to model temporary non take-up[9]. In their simple model the unemployed person chooses the level of job search effort, and similarly has to make effort to claim benefits.[10] They also show that the pool of UI claimants depends on the correlation between UI claiming costs and job search effort costs. They estimate a structural model of UI take-up and non-employment duration (allowing for unobserved heterogeneity in both UI claim and job search effort costs), and calculate various elasticities (based on model simulations). They estimate a 1% higher replacement rate leads to: for claimants, total unemployment duration increases by 0.6% ; but the take-up rate increases substantially, by 1.3%; hence the total elasticity is 1.3% for the unemployment duration.

More recent analysis on US data by Kuka and Suart (2021), who leverage the fact that across US states and over time UI benefit amounts (and entitlement periods) varied substantially to estimate the determinants of UI take-up. The show that that UI take-up rates are higher among individuals with higher earnings and higher replacement rates, while potential benefit duration has a substantially smaller positive effect on the take-up rates.[11] Recently, a couple of papers call attention to the role that employers might play in UI benefits. Lachowska et al (2023) show that, given that UI benefits include an experience rating for employers, they point out that employers have a very important role to play in UI take-up. They show evidence that relatively "low quality' employers tend to deter laid off workers from claiming UI benefits. In a European context, Khoury (2023) shows that at least some employers tend to lay off workers later, in response to a discontinuity in replacement rates of UI benefits at a job tenure threshold in France.

[9] They focus on men aged 30-50, with long PBD [30 months, the max.], to ensure that everybody is eligible, excluding only spells of 1 week or shorter. In France, only about 31% of those eligible claim UI benefits (eventually). Claiming can be delayed, about half of claimants apply within 1 week, but about 20% will claim only after 3 months (avg. duration of claiming is 6 weeks).

[10] Their model shows that more generous UI benefit leads to higher reservation wages, and hence longer non-employment durations for both claimants and (current) non-claimants, as the latter also have the option to claim benefits before finding a job.

[11] While a 1 precent increase in earnings and replacement rates increases the take-up rate by around 20 and 17 precentage points (respectively), a 1 percent increase in potential benefit duration only increases is by 8 percentage points.

Data

Our empirical analysis is based on an individual-level administrative panel database from Hungary, owned by the Databank of the Centre for Economic and Regional Studies (see Sebők (2021) for a detailed description). The data cover half of the country's population aged 0-74 in 2003, who were randomly selected and followed-up until 2017.[12] The database consists of linked data sets of the pension, tax, and health care authorities and the public employment services (hereafter PES) and contains detailed individual-level information on employment and earnings history, use of the health care system, pension, and other social benefits. The PES dataset (Jobseekers' registers) contains information on all registered jobseekers, including UI benefits, and the employment histories required to calculate these. Linking the PES database to the databases of the pension and health care authorities enables us to observe individuals' background characteristics and employment histories of job losers (not only those registered as jobseekers at the PES) , which allow us to calculate precisely both their UI benefit eligibility, their potential benefit duration and UI benefits.[13]

Sample selection and characteristics

During sample selection, we needed to account for the effects of policy design flaws and the imperfections of the data generating process, while ensuring that the sample comprised of genuine jobseekers.

First, we took data on people aged 25-54 who lost their jobs in the first half of 2011 or 2012; thus, we removed all those who could have ended their contract strategically, since the regulatory changes to UI benefits became public knowledge around the end of June 2011. We also filtered out those who were not seeking jobs for one of two reasons. First, those who probably already found a job before the end of their current work contract, and started their new job at most one week after job-loss (similarly to Blasco – Fontaine (2021)). Second, we excluded those who were likely witing for a recall, thus those who returned to their prior employer within a three-month timeframe (see Köllő (2003) for a more detailed analysis of this phenomenon). Additionally, self-employed individuals were excluded because of the difficulty in determining whether their unemployment was due to job loss, a pause between contracts, or working off the books.

The sample was further restricted to individuals for whom benefit eligibility could be accurately predicted. This necessitated the exclusion of women, as they constitute the majority of parental leave recipients in Hungary and their benefit entitlements are therefore difficult to estimate. Additionally, individuals who were not employees in the primary labour market during their previous employment were excluded, as their work histories are often more complex and may lead to errors in the data generation process, resulting in less precise estimations of benefit eligibility. This exclusion was implemented not only because the focus of the study is primarily on employees, but also to ensure the accuracy and reliability of our estimates.

[12] For details, see Sebők (2021).

[13] In fact, having access to UI benefit records allowed us to fine-tune our calculations, and we are able to estimate these quantities with a margin of error or less than 5 percent.

Practical considerations led to further adjustments of the sample. We excluded individuals who took the benefit more than 61 days after job loss, comprising less than 10% of benefit recipients.[14] This was necessary to avoid incorporating the effects of the interim period between September and December 2011 during which most reform changes were implemented but the eligibility base period was extended to five years. To account for this interim period and eliminate the possibility of rent seeking[15], the sample was restricted to individuals with a relatively stable employment history, defined as those who worked at least 360 days in the past 12 months and received wages or salary for at least half of those days (a similar adjustment to what Schmieder, von Wachter and Bender (2016) made to drop those with fractured labour market histories). Additionally, outliers in terms of earnings, health variables, and potential available maximum benefit were excluded, as were jobseekers with very low estimated benefits or no entitlement period.

We followed the same principles when examining the period around the cutoff date of 31st of August 2011. We selected a sample of job losers whose employment spell ended between the 1st of July 2011 and the 30th of August 2011. Since we have the exact date of the start of the UI benefit spell, as well as the end of the employment spell, we can precisely estimate the probability that an individual managed to register as jobseeker before the policy change went into effect. While the interim period did expand the pool of individuals eligible for UI, in this analysis, we keep the sample restricted to those who would have been eligible for at least 40 days of UI benefits under the benefit scheme which went into effect of the 1st of January 2012.

Evaluation strategy

Benefit take-up

In the first step of our analysis, we estimate UI benefit take-up equations, where our key parameters of interest are the changes in the potential benefit duration and/or the changes in the total value of potential UI benefits (which is calculated as the daily UI benefits*PBD). [16]

In our simplest specification, we estimate equations of UI take-up, by pooling years, of the following form:

$$UI_i^t = \alpha + \beta year_i^t + \gamma w_i^t + X'\delta + month_i^t + \varepsilon_i^t$$

Thus, we estimate the effect of the reforms as a simple year effect, while controlling for a host of background characteristics. One of our key variables is prior daily earnings[17], which is an indicator of

[14] Note that this also amounts to leaving persons who quit their job out of the analysis, as they were subject to a 2 month 'waiting period' befoer becoming eligible for UI benefits. We did not see any spikes in UI benefit uptake at this point in time, so we can likely conclude that not many workers chose this option. It is worth mentioning that HUngarian Labour Law allows for the employment relationship to end by 'mutual consent' – not leading to the 2-month waiting period.

[15] Rent seeking was possible due to a regulatory mistake, allowing jobseekers to take the benefit twice: first in the fall of 2011 and then again in the first quarter of 2012.

[16] As we have discussed, daily UI benefits did not change substantially.

[17] Pls not that we calculate this in the same way as it entered the UI benefit calculations. Hence, if an individual worked part-time, or missed a significant amount of days from work, their daily earnings can be substantially below the (daily) statutory minimum wage.

the individual's productivity. We enter this variable as piecewise constant, to allow for more flexibility, with differential effects below the minimum wage as well as above the threshold value for the UI benefit cap. [18] We also use a rich set of background characteristics: age, occupation of prior job, variables describing the place of residence and two indices describing health care spending in the previous year. It is worth noting that we specify the effect of background variables to be constant over the two years. In further specifications, as robustness checks, we also include individual fixed effects and firm fixed effects, which we estimate from an Abowd-Kramarz-Margolis two-way fixed effects regression (on data from 2003-2011)[19]. Finally, we also added proxies for the 'hassle' to apply for UI benefits and of the 'stigma' attached to being on the dole (as described below).

In the next set of regressions, we measure the intensity of the policy change, by calculating, for each individual, the total value of potential benefits based on the 2011, as well as the difference between the 2012 and 2011 rules. We include an interaction between the (absolute value) of this difference and the year 2012, so in other words, this variable takes the value zero in year 2011.

$$UI_i^t = \alpha + \beta^1 PTVUI_{2011_i} + \beta^2 (PTVUI_{2011_i} - PTVUI_{2012_i}) * year_i^t +$$

$$+\gamma w_i^t + X'\delta + month_i^t + \varepsilon_i^t$$

In this specification, we expect that $\beta^1 > 0$ and $\beta^2 < 0$, and we hypothesize that take-up is inversely proportional with the loss in PBD (or total benefit value). We assume that the error term follows Normal distribution (hence estimated probit equations), and estimate several specifications (with varying background characteristics).

Then, we estimate similar regressions, where the key explanatory variable is the total value of UI benefits (the daily UI benefit amount multiplied by the PBD), and the change in its value. One further issue is the inclusion of daily UI benefits in this equation, as it is difficult to separately identify its effect from that of previous earnings. In fact, it can only be estimated relying on (a) functional form assumptions and (b) using the 'kink' in the benefit schedule in the neighborhood of the benefit cap. Thus, we will only include daily UI benefits a handful of specifications. In these specifications, instead of entering the total (potential) value of UI benefits, we separately enter the potential benefit duration (PBD) and the daily UI benefit.[20]

It is worth briefly discussing three aspects of our estimation methods. First, a central feature of our longitudinal matched employer-employee dataset is that it enables us to estimate Abowd-Kramarz-Margolis (1999) wage equations. These allow us to estimate individual and firm fixed effects (pertaining to the most recent employer); where the individual fixed effect contains all (time-invariant) determinants of earnings, including 'unobserved ability'; while the firm fixed effect

[18] In different specifications, we allow this variable to enter the take-up equation in a quadratic form.

[19] Please note that the firm fixed effects were estimated on the whole sample period (2003-2017), in order to maximise the possible number of observations. However, it is likely that the sample for which it was possible to estimate firm fixed effects does not include micro firms.

[20] As a robustness check, we estimated a job finding equation simultaneously with the UI take-up equation, by allowing the error term to be correlated across the two equations. In this specification the UI claiming costs can be related to unobserved job search effectiveness terms. We estimated this specification using a bivariate probit model (hence assuming that error terms are distributed as bivariate normal). Results differed only slightly to those of the probit models estiamted, despite the fact that there is a negative correltation between the error terms of the UI take-up equation and the job-finding equation.

pertains to the firm's wage setting strategy (controlling for the composition of workers). In essence, these can be used as (imperfect) measures of worker and firm 'quality', and we use these as controls in a robustness check.[21] Second, as similar papers in the related literature, we assume that the effect of control variables does not change through time, or in other words, the reform effect can be captured by potential benefit duration or the monetary value of UI benefits. Third, given that we have access to prior labour market and UI register information, we can extract a couple of important control variables, pertaining to the last two years (prior to job loss). We can also use the number of employers an individual worked for over the last two years as one indicator of the 'hassle' (psychic or time costs) applying for UI benefits (as in this period, all documentation of employment records was paper-based). We can also use an indicator whether an individual was registered unemployed previously as a proxy for their 'knowledge' of how the UI system works, but also as a proxy for the stigma associated with being 'on the dole'.

Empirical results on UI benefit take-up

Descriptive evidence

We first show the time-pattern of receiving UI benefits, where our initial interest is whether non-employed workers register as unemployed (and apply for benefits) very quickly upon job endings. Indeed, in our sample, both the proportion claiming is relatively high and registering as jobseeker is prevalent at the beginning of the non-employment spell. We show the survival in unclaimed unemployment for the initial 6 months period, separately by year in the Graph below: these show that in 2012, claimants tend to register slightly quicker. Overall, we can see that at the end of two months, close to 55 percent of UI eligible individuals in our sample registered as jobseeker in 2011, while this proportion was about 2.5 percentage points lower in 2012. It is also clear that this small difference remained stable in the months thereafter.

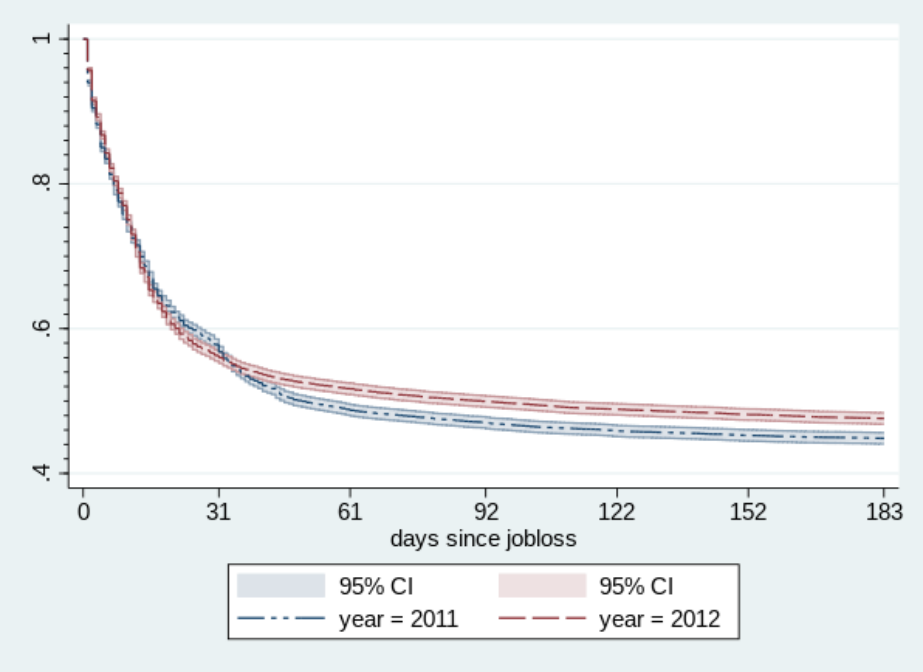
The graph also reveals that in that there were significantly more individuals registering very quickly after job loss in 2012, with 84 percent of those who will eventually contact the PES office doing so within one month (which is 6 percentage point higher than in 2011). However, after 45 days, there is no significant difference in timing, and by the end of two months after job loss, 93 percent of all those who decide to claim UI benefits already did so. [22] This is in stark contrast to Blasco and Fontaine (2021) where they show that for French prime-age males, roughly 20 percent of non-employed claim benefit only after 3 months of non-unemployment. Given this evidence, we decided to treat claiming

[21] We only use data from before the job loss, to exclude the possibility of endogeneity contaminating our estimates. More precisely, for individual fixed effects, we only use data inclusive of 2011, while for firm fixed effects, we use data for the whole sample period.

[22] Thus, the median duration to claiming is 10 (9) days in 2012 (2011), while the average is 20 (19) days.

benefit as a static decision, and we censor claiming at two months of non-employment (meaning that we do not use individuals who claim UI benefits after 61 days of non-employment). [23]

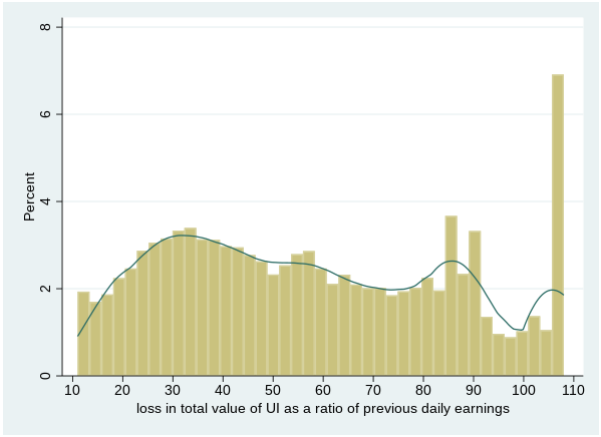
Graph 1: Survival in unclaimed unemployment



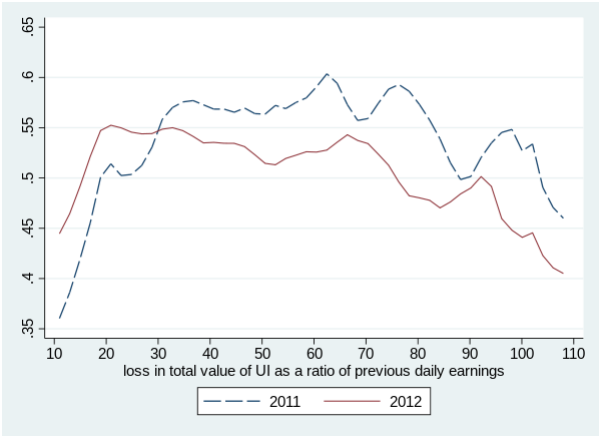
We now turn to some descriptive evidence on changes in claiming behaviour. In particular, we will use the value of UI benefit lost due to the policy change expressed as a ratio of daily earnings (during the last year before job-loss). We use this same measure for claimants in 2011, to show what would have happened to them had the reforms been implemented earlier (assuming no behavioural effect for the moment In the first Graph we show the distribution of potential claimants in 2012 as a function of days lost: we can see that a large proportion had to contend with 90-110 days' worth less UI benefits in 2012.). In the next Graph below, where we show local polynomial smoothing of claiming as a function of UI benefits lost, an interesting pattern can be seen. It is indeed those who were negatively affected where claiming dropped more, but the drop in claiming is not linearly related to the value of the UI lost.

Graph2: Value of lost potential benefits UI benefits (function of daily earnings)

[23] Note that this is also done for a practical reason: we can avoid that individuals losing their jobs in June 2011 end up claiming after the initial reforms have been implemented.



(a) distribution of sample by UI value lost



(b) Ui claiming as a function of lost value

In the next Table, we divide our sample of non-employed into five quintiles based on the value of UI benefits lost, and show some of their key characteristics. In the first column we show the value of UI benefits lost, and see that it varies quite of bit, with those in the top quintile losing almost 100 days' earnings as a result of the regulatory change. By contrast, for those in the bottom quintile, the value of UI benefits decreased by about the equivalent of 20 days' labour income. The next column is of no surprise: it was low earners who lost the most due to the regulatory change (in relative terms). Please notice that those who lost the most due to the reform had earnings which were below the daily minimum wage, implying that they likely worked part time. It is worth a reminder about a prominent feature of the Hungarian UI benefit system: due to the very low UI benefit ceiling, the replacement rate among high earners is well below the nominal 60%.[24]

Table 1 Mean values for 2012 jobseekers (except for last column), by quartiles of the ratio of maximum cumulated benefits to previous daily earnings

	Loss in UI (as % of earnings)	Previous earnings (daily HUF)	N. of insured days over last 4 years	PBD 2011 rule	PBD 2012 rule	UI takeup rate in 2012	UI takeup rate in 2011
1	20,4	8972	885	177	71	0,533	0,566
2	36,2	4858	967	194	78	0,620	0,601
3	52,7	4354	1178	236	87	0,627	0,589
4	73,8	3407	1268	254	89	0,611	0,569
5	98,3	2581	1334	267	90	0,540	0,487

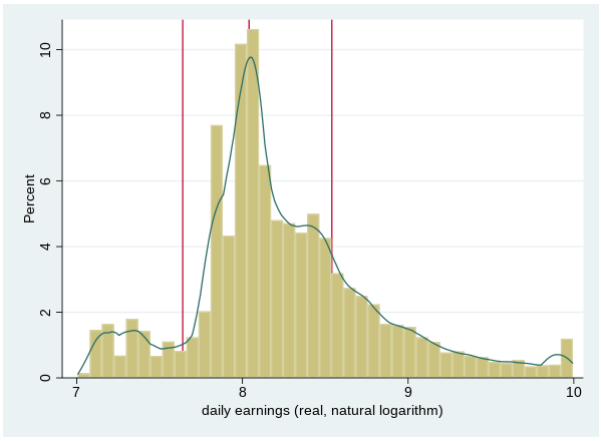
The next column shows the other factor driving the UI value losses: differences in the stability of employment histories. Those who lost relatively little, worked about 60 percent of the previous four years, while those who lost the most were employed for more than 90 percent of the days. The next two columns document just how drastic the cut in the potential benefit duration was. 60 percent of job losers would have been eligible for 8 months' (or more) of UI benefits in the 2011 regime, and lost at least 150 days on average. Even those who lost the least saw their PBD cut from 6 months to

[24] For instance, among those who lost relatively little, the replacement rate is on average around 40 percent only. Also note that the benefits lost were from the second, flat-rate portion of UI benefits.

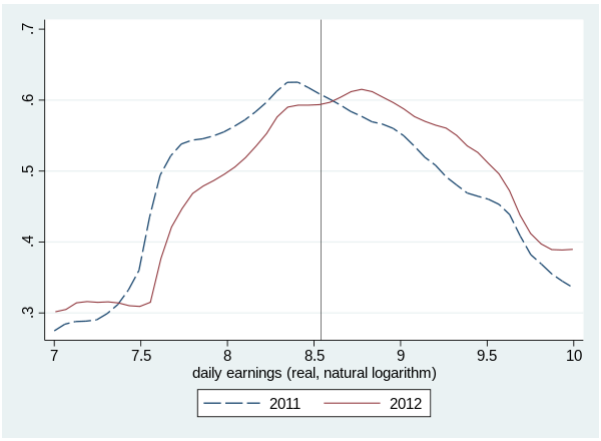
around 10 weeks. In the final two columns we display UI take-up rates for both years. This shows that the relationship between the loss in the value of UI and changes in take-up rates was non-linear. In the top quintiles, take-up rates decreased by about 5 percentage points (by close to 10%). In third and fourth quintiles, UI claiming rates decreased by around 4 percentage points (or around 7%). In the second quintile, claiming rates hardly decreased; while in the bottom quintile (eg. Among high earners), UI take-up rates actually increased.

In the next graphs we show the distribution of (previous) earnings and its relation to claiming behaviour, where we display the natural logarithm of daily earnings (as used in the calculation of daily UI benefit amounts). In the first Graph, we can see two interesting facts. First, about one-fourth of the sample had earnings which put them above the UI benefit cap. Second, a fairly large portion of the sample (around 11 percent) earned lower than 80% of the minimum wage – thus they work in irregular jobs (public works), did not work full-time, or were on long-term sickness benefit (or did not receive pay for some other reason). In the second panel of Graph 3, we show the UI take-up rate as a function of daily earnings, with four significant phenomena. One, that the UI claiming rate of very low earners is only around one-third. Two, that UI claiming rises sharply with earnings, with 60% of individuals around the UI benefit cap registering as unemployed. Three, that take-up rate of UI benefits decreases for higher earners: among those earning more than 3 times the minimum wage (the top 12% of our sample) the UI claiming rate is around 42 percent. Four, that claiming decreased in 2012 (relative to 2011) for those below the UI benefit maximum threshold, while it increased for those above it.[25]

Graph3 : Value of lost potential benefits UI benefits (function of daily earnings)



(a) distribution of earnings



(b) UI claiming by earnings

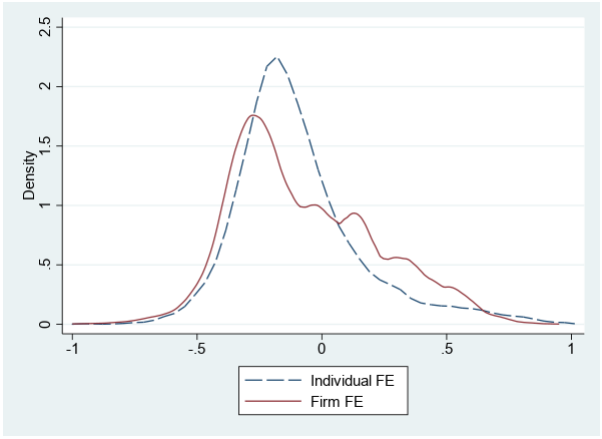
Finally, we also show the distribution of estimated individual and firm fixed effects from the AKM models, as well as how they relate to UI benefit take-up.[26] In the left panel, we can see that – as expected – job losers' come from the lower part of the distribution of individual fixed effects, and

[25] The median earnings of UI claimants increased by 5% in 2012 (relative to 2011). The difference in median earnings in 2012 between UI claimants and UI non-claimants was 16%, while it was only 8% in 2011.

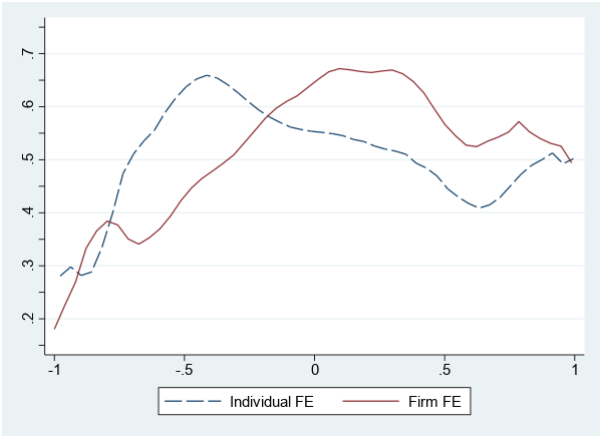
[26] In these Graphs, we only show the year 2011, but patterns were very similar for 2012.

they also tend to come from low paying firms (although with a somewhat larger dispersion).[27] What is more remarkable (as shown in the left panel) is that the patterns of the take-up of UI differs markedly across individual and firm fixed effects. In terms of individual fixed effects, it seems that those who claim UI tend to be of "lower productivity" than the typical job loser, with the above-median job loser having a significantly lower probability of claiming.[28] By ,contrast, it is those who lost their job at an above median paying (productivity) firm who take up UI benefits. Individuals who worked at a low-wage firm tend to apply for UI benefits much less, by almost 20 percentage points.

Graph 4 : Estimated individual and firm fixed effect and relationship to UI take-up



(a) density of individual and firm fixed effects



(b) UI take-up as a function of fixed effects

The determinants of UI take-up

In this section, we present a series of estimates of UI benefit take-up, formulated as a static probit model. We focus on two issues: (a) to present the main determinants of take-up, and (b) to estimate to what extent the decrease in PBD is associated with lower take-up rates in 2012. On average, the take-up of UI benefits was 2.25 percentage points lower in 2012, which represents a small, 4% decrease over 2011.

First, we discuss results where we allow for a simple additive effect of the year 2012, and we show a few alternative specifications (we display marginal effects). In the first set of specifications we allow for a flexible (quartic) function of previous earnings and include a total value of UI benefits, as calculated based on the 2011 regulations. The decrease in 2012 is estimated to be around the same value as the raw difference, hence the composition of job losers changed very little across the two years. The total potential value of UI benefits tends to have a very small positive effect on UI claiming (ceteris paribus), with a one standard deviation increase leading to a 1.4 percentage point increase in the take-up rate.

[27] Pls note that the fixed effects were estimated for the whole working population (individuals and firms employing them), and hence have a mean zero.

[28] This pattern is very similar to the relationship between earnings and UI benefit claiming.

As for our control variables, we find large effects. There are very pronounced differences across occupations, with managers, professionals, former armed forces type occupations claiming UI benefits with 7-10 percentage points lower probability, while agricultural workers and unskilled workers claiming with about 10 percentage points higher probability. We also found large regional differences (up to 13 percentage points), and pronounced differences across micro-regions with lower and higher Roma minority.[29] We estimated a negative effect for those with higher health care spending (and more GP visits) – which might imply that these individuals are more likely to seek alternative benefits.

When adding variables characterizing recent labour market histories, we find that those with more recent employers have a lower claiming propensity (keeping the number of days worked fixed).[30] One interpretation is that having more employers indeed raises claiming costs through having to chase up more papers. Our results consistently show that each additional employer decreases the claiming probability by around 6 percentage points. By contrast, having been registered jobseeker in the past two years substantially (by 15 percentage points) increases the probability of claiming, hence it is likely that this is a good indicator of either information or lack of stigma.

Table 2 Take-up probit with 2011 eligibility days rule: year effect, marginal effects at the mean

	(1)	(2)	(3)
Year: 2012	-0.021*	-0.023*	-0.022*
	(0.005)	(0.005)	(0.005)
Total value of benefits (2011 rule)	0.009*	0.010*	0.036*
	(0.002)	(0.003)	(0.003)
Base controls	x	x	x
Other controls	Avg. earnings (quadratic)	Avg. earnings (quadratic) + Fixed Effects	Avg. earnings (quadratic) + Fixed Effects + recent emp. and UI
Observations	39,258	39,258	39,258

Robust standard errors in parentheses

+ $p < 0.1$, * $p < 0.01$

The outcome variable is a dummy with value 1 if the jobseeker took up unemployment benefit. Control variables are suppressed for brevity. The total value of benefits is expressed as 100,000HUF, this variable has a mean value of 4 and a standard deviation of 1.4.

[29] Moving from a region with the median proportion Roma (2 percent in our data) to one at the 9th decile (with a 7.3 percent Roma population) increases the UI take-up by about 4.4 percentage points.

[30] The estimated effect of the Fixed Effects tends to be in line with the descriptive evidence, with individual fixed effects decreasing the claiming probability, but firm fixed effects increasing it.

We also experimented with adding the total value of UI benefits in two parts: the daily UI benefits and the potential benefit duration (PBD, based on 2011 regime). When decomposing the total value of UI benefits into PBD and daily UI, we estimate a very small positive effect for PBD, but a significant negative effect for UI benefits. However, this latter is estimated off of the 'kink' in the benefit schedule at the maximum benefit threshold, and hence is sensitive to functional form assumptions. In the next robustness checks, we varied the functional form of a few key variables. More specifically, we entered potential total value of UI (or the PBD) in a logarithmic form, as well as prior earnings in a logarithmic form. We also added a spline in prior earnings, allowing it to have different effect below the minimum wage, and above the maximum benefit threshold. This does alter the coefficient of the potential total value of UI, but the reform effect is estimated to be only slightly lower, around 1.6 percentage points. We find similar results when using the PBD in a logarithmic form, and find that a 1 percent increase in potential benefit duration increased the take-up probability by around 2.6-3 percentage points (depending on the exact specification). [31]

Table 3 Take-up probit, intensity treatment: difference in total value of UI benefits 2011-2012 rule , marginal effects at the mean

	(1)	(2)	(3)
Difference in total value of benefits (2011-2012 rule)	-0.009* (0.002)	-0.009* (0.002)	-0.009* (0.002)
Total value of benefits (2011 rule)	0.011* (0.003)	0.013* (0.003)	0.052* (0.003)
Base controls	x	x	x
Other controls	Avg. earnings (quadratic)	Avg. earnings (quadratic) + Fixed Effects	Avg. earnings (quadratic) + Fixed Effects + recent emp. and UI
Observations	39,258	39,258	39,258

Robust standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.01$

The outcome variable is a dummy with value 1 if the jobseeker took up unemployment benefit. The natural logarithm of main control variables (presented in the table) are included in models (2) and (4) while coefficients of the non-transformed scale are presented in models (1) and (3). Other controls are suppressed for brevity.

[31] We estimate a slightly weaker association between earnings and take-up below the minimum wage than above it, and found that for earnings above the cap of UI benefits the take-up rate is again significantly less stongly correlated with earnings than below it.

Now we turn to estimating the effect of the intensity of the reform. First, entering the differences in total value of UI benefits, we find that indeed, those who lost more days were less likely to claim benefits. However, this effect is relatively small at the average value of the UI benefits lost, this is a corresponds to a 1.9 percentage point decrease in claiming probability at the mean. Second, logarithmic specifications of PBD imply similar effects, while we see a positive effect of the baseline PBD on UI take-up probability.

Table 5 Take-up probit, intensity treatment: difference in total value of UI benefits 2011-2012 rule , marginal effects at the mean

	(1)	(2)	(3)
Log Difference in PBD (2011-2012 rule)	-0.015* (0.005)	-0.018* (0.005)	-0.015* (0.002)
Log PBD (2011 rule)	0.029* (0.008)	0.035* (0.008)	0.113* (0.009)
Base controls	x	x	x
Other controls	Avg. earnings (quadratic)	Avg. earnings (quadratic) + Fixed Effects	Avg. earnings (quadratic) + Fixed Effects + recent emp. and UI
Observations	39,258	39,258	39,258

Robust standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.01$

The outcome variable is a dummy with value 1 if the jobseeker took up unemployment benefit. The natural logarithm of main control variables (presented in the table) are included in models (2) and (4) while coefficients of the non-transformed scale are presented in models (1) and (3). Other controls are suppressed for brevity

Thus, our results on UI benefit take-up lead to two over-arching results. First, that differences in background characteristics of non-employed across the two year do not explain why we only get a very small 'reform effect' on UI claiming behaviour. Second, that while the loss in PBD (or the total value of UI benefits) - in other words, the intensity of the 'treatment' – is associated with lower UI claiming, but this effect is relatively weak.

The timing of UI benefit take-up

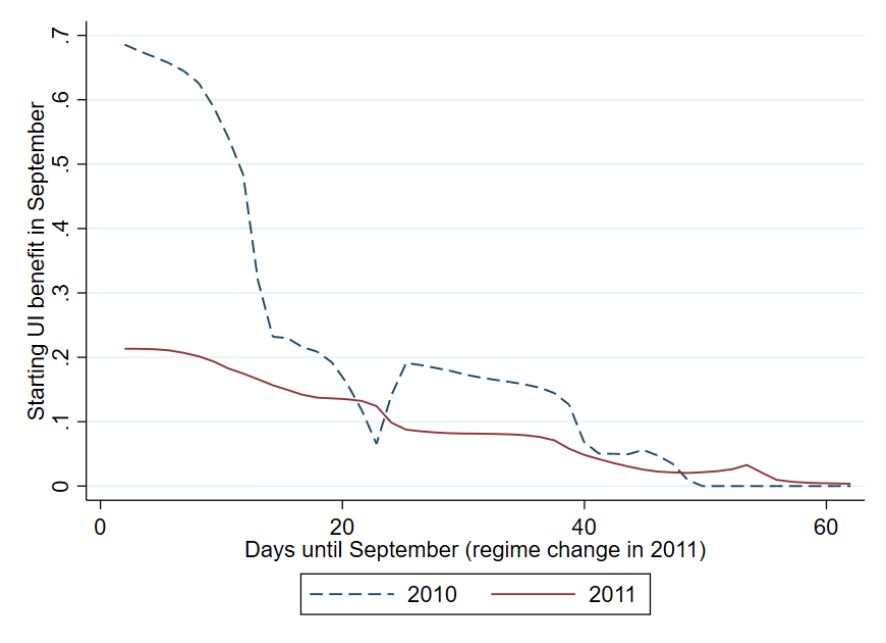
During the summer of 2011, there were a large groups of individuals for whom claiming UI benefits before the policy change came into effect could mean that they avoided a large loss in (potential) income flows. There could be several factors behind being "late" for claiming UI benefits under the scheme in effect until August 31st 2011. First, the individual could have been overly optimistic about their job prospects, hoping that they find a job quickly before having to resort to UI benefits. This might have been especially relevant for individuals living in more prosperous areas with stronger

labour demand.[32] Second, they might have been underinformed about the reform and its consequences. Third, they may be facing costs leading to a delay such as collecting all relevant documents to prove UI eligibility – it is worth remembering that at the time of the reform government and firm administration was mostly paper-based. There might also have been congestion costs, especially if a given PES local office was not ready for sudden surge in new registrations.

Clearly, the most important determinant of successfully claiming UI benefits before the reform came into effect is the amount of time one has – this is shown in Graph 5, below. The relationship is clearly negative, - with those losing their jobs after the 20th of August 2011 having a one-in-five chance of being "late"; while for those losing their jobs in July 2011, this was only 5 percent. Those who lost their job in August 2011 were substantially less likely to delay take-up until September compared to those who became jobless in August 2010. However, a significant proportion of people still delayed take-up until after the new scheme started in 2011.

Next, we estimate the determinants of claiming UI under the new benefits scheme. Our key independent variables are similar to the take-up equations, thus the potential benefit duration and the past earnings (or the total value of UI benefits). We also include the number of past employers in the past three years, which will proxy the costs of gathering all relevant papers – as we expect that ceteris paribus more employers means more "hassle". Furthermore, we also include a dummy variable for those who have claimed UI benefits in the past, this might proxy a variety of factors, starting from having more information on the claiming process to having a lower personal distaste for "being on the dole".

Graph 5: Locally smoothed polynomial of starting UI benefit in September vs days until September at job loss



Graph shows the relationship between the days until September (when the new scheme starts in 2011) at the time of job loss and the probability of starting benefit in September or later. We used and Epanchenikov kernel for smoothing with a bandwidth of 3 days.

[32] This might also be related to the stigma of claiming UI benefits.

Table 6 shows estimates of two probit regressions, explaining whether people entered benefit before or after September 1, for 2010 and 2011 separately. More precisely, we examine the change in the proportion of people entering "late" compared to a year before. We focus on the difference between the changes in the two years, because the level of change could lead to misleading results, primarily due to differences in sample sizes: the 2010 sample is much smaller (972 people compared to 3479 in 2011), so estimates from 2011 will be more likely to be significant, even if the population parameters are the same. The difference in sample size also makes it more likely that some people in 2011 lost or left their job (earlier) as a behavioral adjustment to the regulation change.

There are three statistically significant differences between the two years' coefficients. The first is the days until September (the month of the regulation change in 2011), the same difference that was indicated by eyeballing Graph 5. Days until September counted less towards entering benefit earlier in 2011; indicating that people in 2011 were on average more determined to enter benefit before September than in 2010 or that those who left their jobs in August might have timed this strategically. Having prior experience with taking UI benefit also contributed more in 2011: even 1 prior entry to benefit resulted in a significantly lower probability of a delayed entry in 2011, while this coefficient was positive in 2010. Finally, there is a clear difference in the effect of prior employment, people who had a more stable employment history were more likely to enter UI benefit before September in 2011, while the effect was opposite (and nonsignificant) in 2010. This implies that individuals who were to lose the most from the PBD cut likely acted to avoid these large losses. Other measures, such as age, congestion at the PES office (measured as UI benefit entries in August compared to the previous year), the number of previous employers, past earnings, estimated individual fixed effects, and regional variables did not yield significant effects, the sense that they are not significantly different from 2010 results.

Table 6: Probit of delayed take-up (take-up after 1st of September)

	(1) 2010	(2) 2011	p-value (two sample T-test)
Age	-0.00723 (0.00598)	-0.00256 (0.00402)	0.5707
Days until Sept.	-0.0508*** (0.00392)	-0.0279*** (0.00204)	0.0001
Congestion at the PES office (compared to prev. year)	-0.265 (0.345)	-0.579*** (0.223)	0.4945
Number of employers (past 4 years)	0.0535 (0.0404)	0.0959*** (0.0256)	0.0118
Times on benefit (since 2003): 1	0.101 (0.119)	-0.256*** (0.0815)	0.0321
Times on benefit (since 2003): 2	-0.0133 (0.152)	-0.292*** (0.0985)	0.1697
Times on benefit (since 2003): 3+	-0.410* (0.216)	-0.368*** (0.116)	0.8652
Log daily mean past earnings (4 full calendar months)	0.0931 (0.118)	-0.147* (0.0792)	0.1391
Months employed (past 4 years)	0.00659 (0.00588)	-0.0200*** (0.00351)	0.0003
Log of complex development indicator (micro-region level)	0.0345 (0.199)	0.424*** (0.132)	0.1507
Ratio of roma in the micro-region	0.167 (1.612)	-1.137 (1.202)	0.5913
Constant	-0.124 (1.267)	0.414 (0.869)	0.7619
Observations	972	3479	

*Robust standard errors in parentheses. Coefficients of health indicators, Budapest dummy, and individual-specific fixed effects of productivity are suppressed for brevity. Sample consists of people losing their jobs in August and July of each year, following at least a year of employment, entering UI benefit within 6 months after. People were excluded from the sample if any of the following conditions applied: (1) not eligible for UI benefit, (2) reemployed by original employer within 3 months, (3) spent more than three months as an entrepreneur in the past 3 years, (4) took UI benefit more than two months after job loss, (5) outlier in health status or earnings. The outcome is a binary variable indicating whether the person entered benefit after September 1. The rightmost column shows p-values from independent sample t-tests of coefficients. For corresponding average marginal effects see Table A2 in the Appendix. * p < 0.1, ** p < 0.05, *** p < 0.01*

Conclusions

In this paper, we shed light on the determinants of unemployment insurance benefit take-up in Hungary. We are the first to calculate UI benefit non take-up rates in Hungary, using a large sample of matched administrative datasets, where we can reliably estimate UI benefit eligibility. We show that even for a sample of prime-age male workers with stable employment more than 40 percent of those eligible do not apply. At the same time, we find that individuals do not tend to postpone (potentially hoping for quick re-employment) to apply for UI benefits, 93 percent of those who eventually apply for UI benefits do so within two months of job loss.

We used a drastic cut in the potential duration of benefits to evaluate to what extent monetary incentives affect UI benefits take-up. We only find moderate effects. On the one hand, take-up rates of UI benefits decreased by about 4 percent. On the other hand, the composition of UI beneficiaries changed, with those for whom the value of UI benefits relative to their prior earnings decreased the most foregoing UI benefits the most. As this meant that low-wage individuals with stable employment did not take up benefits, a group who is very unlikely to have savings. This is alarming from a social policy perspective. On the one hand, the limited response to a large cut in potential benefit duration is largely consistent with the theoretical literature, that if individuals expect to be re-employed quickly, they do not value longer PBD. However, given the severity of the reform, it is more likely that a substantial groups of individuals might have had limited savings, and hence used UI benefits despite its very short duration. We also found a role for firms in UI benefit take-up, with those losing their jobs at high paying firms applying UI benefits in a higher proportion. This is a phenomenon which needs to be investigated further.

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Appendix

Table A1: Main features of the unemployment insurance benefits in Hungary, 2011

Benefit, time period	*Entitlement conditions*	*Length of entitlement*	*Minimum and maximum duration*	*Replacement rate*	*Minimum benefit*	*Maximum benefit*
2011 August						
Jobseekers Allowance, Phase 1	A minimum of 365 days of contribution payment in the previous four years	5 days of contribution payment = 1 day benefit entitlement; half of total entitlement length	Minimum 36,5 days; maximum 90 days	60% of taxable wage in previous 4 quarters	60% of taxable wage in previous 4 quarters	120% of the minimum wage applicable on the first day of benefit period
Jobseekers Allowance, Phase 2	A minimum of 365 days of contribution payment in the previous four years	5 days of contribution payment = 1 day benefit entitlement; half of total entitlement length	Minimum 36,5 days; maximum 270 days	Flat rate: 60% of the minimum wage applicable on the first day of benefit period	-	-
2011 September						
Jobseekers Allowance	A minimum of 365 days of contribution payment in the previous five years	10 days of contribution payment = 1 day benefit entitlement;	Minimum 36,5 days; maximum 90 days	60% of taxable wage in previous 4 quarters	60% of taxable wage in previous 4 quarters	100% of the minimum wage applicable on the first day of benefit period