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Turning static pessimism to dynamic optimism

An ex-ante evaluation of unemployment insurance reform in Finland

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WORKING TOGETHER FOR WELLBEING

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ABSTRACT

This paper investigates the effects of a Finnish unemployment insurance reform that took place in 2017. The potential duration of earnings-related unemployment benefit was cut by 100 days. We use the microsimulation method to calculate both static and dynamic ex-ante effects on employment, public sector finances and income distribution. According to the static scenario, income inequality increases slightly. However, accounting for the behavioral response mitigates the effect on inequality. Respectively, the positive effect on public finances is amplified.

Keywords: unemployment insurance, microsimulation, employment, income distribution, public finances, inequality, policy reforms, evaluation, Finland

FOREWORD

We would like to state our gratitude to Henri Keränen, Allan Seuri and Olli Kannas for useful comments. In addition, we would like to remind that we do not represent the official views of our background organizations.

1 INTRODUCTION

Can a cut in unemployment benefit decrease income inequality? How does a dynamic behavioral response of a reform affect the conventional measures of income inequality? The first question sounds strange because usually measures of income distribution are calculated on static basis, i.e. without a behavioral response. In static terms, it is rather obvious that a cut in unemployment benefit increases income inequality. However, measures of unemployment benefit cuts are often aimed to increase the employment rate. Therefore, it is well founded to consider the behavioral labor supply response when measuring the effect of reforms on income inequality.

The contemporary economic environment in Finland is distressing. Employment rate is low compared to the Nordic peers. Unemployment rate has risen considerably since 2008, and the recovery has been sluggish. While rising benefit expenditure during recession is considered an automatic stabilizer and as such would not be a major issue if only had the long-term unemployment remained stable – but it has not. Long-term unemployment has almost tripled between 2008 and 2016. The high level of long-term unemployed and the persistently low employment rate in comparison to other Nordic countries hints that the Finnish labor market might suffer from accentuated structural unemployment.

Motivated by the grim employment situation and increasing public debt, the Finnish government decided, among other things, to cut the potential benefit duration (PBD) of the earnings-related unemployment benefit by 100 days. The reform was legislated in the beginning of 2017. However, as the cut in PBD will affect only new unemployment spells, the first visible effects of the cut in unemployment benefits will be seen in the fall of 2018. The reduction of the benefit duration by 100 days is expected to shorten the duration of new unemployment spells.

Incentives to work and on the other hand, reducing inequality are important but often contradicting political targets. From the perspective of inequality, benefit cuts are often considered damaging. Static analyses using microsimulation model have become increasingly common in bringing forth knowledge of the distributional effects of various tax-benefit reforms (De Agostini et al. 2015). However, when evaluating benefit cuts, neglecting the behavioral effects can result in biased and pessimistic estimates in terms of fiscal and distributional outcomes. In previous literature, some dynamic analysis has also been conducted concerning various related policy measures (Ball et al. 2013; Bova et al. 2013). Dynamic analysis using microsimulation method, however, is scarce to our best knowledge. Furthermore, the use of dynamic microsimulation models could bring further detailed evidence on the distributional effects of fiscal policy, through a better understanding of the combined changes in incentives, labor market outcomes, and static fiscal effects on the population.

Our aim is to analyze the distributional effects of the 2017 PBD cut using a microsimulation model of the Finnish households (SISU). In addition to the conventional static analysis, we assess the changes in labor market outcomes based on labor supply elasticities from previous empirical literature. The novelty of the paper is applying the changes in micro-level, allowing a credible distributional analysis of the reform.

This paper is organized as follows. The first section describes the institutional environment and the details of the earnings-related unemployment benefit scheme in Finland. Next, we move to review the existing empirical evidence on the labor supply effects of unemployment benefit cuts. In section four, we present the data and methods used. We then move to present the simulation results. The last section concludes.

2 INSTITUTIONAL ENVIRONMENT AND THE REFORM

The Finnish unemployment insurance is divided into an earnings-related and a flat-rate benefit scheme, which are roughly the same size in the number of recipients. In both schemes, the person must be between 17 and 64 years of age and actively looking for work in order to receive unemployment benefit. While incorporating higher benefits, the eligibility to earnings-related scheme is more restricted than to the flat-rate scheme. For instance, the unemployed must fulfil the employment condition, i.e. working at least 18 hours a week for 34 weeks in the 28 months before becoming unemployed, and be members of an unemployment fund[1]. In addition, unlike in the flat-rate scheme, the duration of earnings-related benefit scheme is limited. After exceeding the PBD, unemployed can apply for the unemployment benefit from the flat-rate scheme.

The Finnish government cut the PBD as of the beginning of 2017. Before the reform, the PBD extended to 500 working days (approx. two years) and 400 working days for those with less than three years of work experience. The reform was to cut the PBD by 100 days. However, individuals older than 58 did not observe a change in their PBD if they had more than five years of work experience and still fulfilled the employment condition at the age of 58.

The system also incorporates the so-called unemployment tunnel, which in 2017 concerned individuals who reach the age of 61 by the end of the year. A person in the unemployment tunnel will be entitled to extended earnings-related allowance until turning 65, the official retirement age in minimum pensions. The unemployment tunnel remained intact in the reform, which is outlined in Table 1 (p. 7).

1 Large majority of employees in Finland are members of an unemployment fund. The average membership fee was between 23 and 174 €/year, or, 0.17 and 2.7 percent of yearly gross wage in 2015 and it is deductible in taxation. The benefit is administered and paid by unemployment funds of which there were 29 in 2015. The number of unemployment funds has been in a declining trend for a longer time.

Table 1. Potential benefit durations (PBD) in the earnings-related unemployment benefit of Finland scheme before and after 2017.

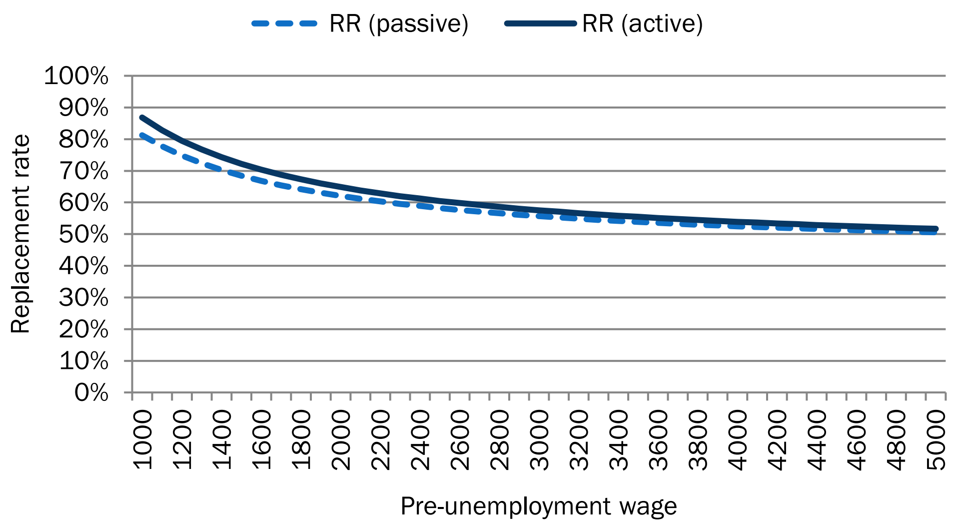
	PBD pre-reform	PBD in the reformed system
Less than 3 years of work history	400	300
Over 3 years of work history and less than 58 years of age	500	400
Over 3 years of work history and more than 58 years of age	500	500
Eligible to the unemployment tunnel	Max. 1,532[a]	Max. 1,532[a]

[a]Assuming that one calendar year consists of 258 working days.

The PBD cut was a part of larger set of reforms aiming to decrease total costs of the earnings-related scheme by 200 M€. The PBD cut was estimated to amount to 159 M€ (Government bill 113/2016). Other changes included increasing the waiting period of the benefit from five to seven days, lowering the amount of increased allowance paid during an employment promoting measure, and abolishing the right to the increased amount based on extensive work history. We concentrate on the duration cut, which constitutes the most substantial part of the reform.

The earnings-related benefit in Finland is calculated based on one's pay before the unemployment. The benefit amount consists of the basic component (amount of flat-rate benefit), the earnings-related component and the child increases[2]. As demonstrated in Figure 1, the benefit amount has no ceiling but the replacement rate (RR) declines with higher wages.

Figure 1. Determination of earnings-related unemployment benefit in 2017.



2 The amount of the basic component equals the basic unemployment allowance, which is EUR 32.40 in 2017. The earnings-related component is 45 percent of the difference between the daily pay and the basic component up until EUR 3078 in 2017 after which the earnings-related component is 20 % of the exceeding amount. An unemployed person will receive a child increase for children less than 18 years of age. Child increase is EUR 5.23, 7.68 and 9.90 for one, two and three children, respectively. Moreover, in 2017, an individual can also receive increased allowance if she is participating in an employment promoting measure (maximum of 200 days). The increased earnings-related allowance is 55 % of the difference between the daily pay and the basic component up until EUR 3078 after which the percentage is 25. The unemployment benefits are taxable income with the tax rate being appr. 20 percent at lowest and slightly increasing with higher benefits.

3 POTENTIAL BENEFIT DURATION IN EARLIER RESEARCH

There is a vast body of both empirical and theoretical literature related to labor market effects of unemployment benefits (for an older overview, see for example Krueger and Meyer 2002). Especially North American research is plentiful, but empirical evidence is also available from Europe and the Nordic countries. More recent behavioral economic theory has paid attention specifically to the duration of the unemployment benefits as a crucial factor explaining the changes in re-employment rates (see Della Vigna et al. 2016), with empirical evidence suggesting that even without changing the overall generosity of the unemployment benefits, reducing the duration of benefits may increase re-employment rates.

In a review article, Tatsiramos and van Ours (2014) analyze the results of six articles, the latest being from 2012. The authors conclude that a PBD increase of 100 days extends the unemployment spells by 20 days on average, with some variation across countries. The benefit elasticities seem to range between 0.4 and 1.0.

In the U.S., typical unemployment benefit amounts roughly a half of the prior wage (up to a certain limit), PBD being 26 weeks, i.e. half a year. In their study, Farber and Valletta (2015) exploit the PBD reforms in different states to disentangle the causal effect. They find a small but statistically significant effect of PBD on unemployment: an increase of 100 days in the PBD resulting in an increase of six days of unemployment. Hagedorn et al. (2015) employ the abolishment of all state level increases in the duration of the unemployment benefits. By comparing neighboring municipalities of different states, they conclude that a one percent change in the PBD results in a 1.4–2.3 percent change in employment and a 0.6–1.2 percent change in the participation rate. Furthermore, the authors estimate that the PBD cuts explain 50–80 percent of the improvement of the aggregate employment in the United States in 2014.

Because of the existence of the flat-rate scheme in Finland, the reduction in PBD can also be interpreted as a cut in the unemployment benefit level and vice versa. In the Finnish context, Uusitalo and Verho (2010) analyze the effects of an unemployment benefit increase using a natural experiment, and find that a 15 percent raise in the average earnings-related unemployment benefit amount reduce the re-employment rates by 17 percent.

Kyyrä and Pesola (2016) analyze the effects of unemployment benefits on unemployment exits and labor market outcomes using a regression kink design. According to their findings, a higher benefit level prolongs unemployment with an elasticity between 1.5 and 2. The elasticity of moving from unemployment directly to employment is found to be around -0.5. However, the results are somewhat sensitive to the choices of bandwidth and polynomial order.

Kyyrä et al. (2017) exploit the variation in remaining benefit duration days at the beginning of subsequent unemployment spells in their causal specification. The authors find, among other things, that an additional week of earnings-related unemployment benefits increases the expected unemployment duration by 0.15 weeks.

As a summary, the empirical evidence on the effect of both the benefit level and duration on employment is largely and nearly unambiguously in line with the expectations drawn from economic theory. Changes in unemployment benefits affect the length of the unemployment spells. Respectively shorter unemployment spells yield a higher aggregate rate of employment.

4 DATA

All statistics and evaluations presented in this research are based on a data set of roughly 800,000 individuals, i.e. 15 percent of Finnish population. The data have been compiled from multiple administrative sources by Statistics Finland. The data includes comprehensive information on paid social security benefits and taxation. It represents the total population as it is in the end of 2014.

The unemployment spells are not explicitly observed in the data but only the number of unemployment days. The accumulated number of earnings-related benefit days is observed on quarterly basis. If a person is employed after an unemployment spell and fulfills the employment condition again (see Section 2), the counter of accumulated days resets to zero. Using the counters and the total number of unemployment days during the year, we are able to deduce individual's maximum number of accumulated unemployment days during the year of 2014. The reform is applied to this information.

Approximately 330,000 persons received earnings-related unemployment benefit in Finland during 2014. The reform divided the unemployed in three groups by their PBD instead of previous two. After the reform, the shortest PBD of 300 days is implemented for the ones with weak previous labor market attachment. As presented in Table 2, this group constitutes eight percent of all recipients of earnings-related benefit. Three out of four unemployed have their PBD decreased to 400 days. Potential benefit duration of the remaining 17 percent remains at 500 days or more.

Table 2. The distribution of socio-demographic features by duration categories.

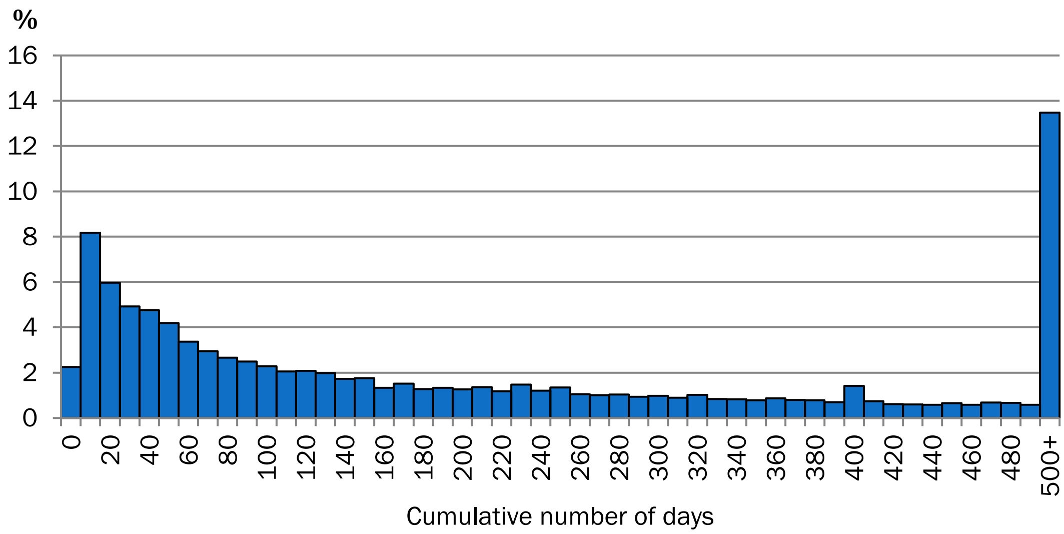
The potential duration (new/old)	N	%	Female, %	Average age	Average work history[a]	Average benefit, €/day	Receipt of benefits, %[b]	
							Housing benefits	Social assistance
300/400	24 941	8	50	30	2	57.1	28	15
400/500	248 562	75	49	43	11	70.3	13	8
500+/500+	56 535	17	48	61	14	70.0	6	3
All	330 038	100	49	45	11	69.2	13	8

[a]Information available since 1997, i.e. the maximum is 17 years.
[b]Receipts during the year. Not necessarily simultaneously with unemployment benefit.

Defined by legislation, the division by PBD is determined by age and work history. Therefore, the average age is naturally the lowest in the first group, 30 years, and highest in the last group, 61 years. Being highly correlated with age, the benefit levels and receipt of means-tested benefits, i.e. housing benefits and social assistance, are distributed in a similar way. The group with potential duration of 300 days has clearly the lowest levels of unemployment benefits and consequently receives means-tested benefits more often.

As can be seen in Figure 2, the cumulative number of unemployment benefit days before the reform had a bimodal distribution with peaks in very short spells (10 days) and at maximum duration (500 days). There is also a small concentration at 400 days, which equals the PBD of those with short work history.

Figure 2. Pre-reform distribution of cumulative days of earnings-related benefit by the end of 2014, percent of the recipients.



5 METHODS

We evaluate the impact of the reform by using microsimulation of population registers (see e.g. Bourguignon and Spadaro 2006). By calculating counterfactual benefit sums according to different legislations, we can distinguish the static impact of the reform to the individual as well as to the whole population, given that our data represents the total population.

We base our calculations on the static microsimulation model SISU[3] complemented with a module that enables us to calculate an behavioral change in labor input, and also to assess dynamic change in public expenditures and income distributions.

Estimation of the behavioral response has been conducted as follows. First, we define the unemployment benefit elasticity, η:

3 Description of the model is available at: http://www.stat.fi/tup/mikrosimulointi/index_en.html.

$$\eta = \frac{d(log(Dur))}{d(rr)} \tag{1}$$

The elasticity parameter is defined as the percentage increase in unemployment duration (Dur) in response to a one percentage-point increase in benefit replacement rate (rr).

Due to the limits of the data related to observing the exact unemployment durations, we apply an elasticity estimate of the benefit level rather than the duration. We do not consider this as a major flaw because we interpret the two being close to analogous, since we simulate the change in benefits as if all unemployment spells observed in the data had begun under the new legislation. Under these restrictions, from the perspective of a beginning unemployment spell, a benefit level cut is roughly equal to the duration cut in terms of average replacement rates over the potential benefit duration.

In choosing the elasticity estimate, we follow the review by Tatsiramos and van Ours (2014) who conclude that the benefit elasticity of equation (1) ranges between 0.4 and 1.0. We use the mean value of 0.7 as our baseline specification. However, we present additionally results from static simulation (elasticity 0) as well as with elasticities of 0.4 and 1.0 to illustrate the sensitivity of the estimates.

It is possible that a single homogenous and constant elasticity is not realistic. We therefore introduce variation in the benefit elasticity by weighting it with predicted employment probabilities, which correlate with labor supply elasticity[4]. The distribution of elasticities (η_i) can be denoted:

$$\eta_i = \frac{p(a_i)}{p(\overline{a})}\eta \tag{2}$$

The regression model specification, estimated coefficients, and the weight distribution are reported and shortly discussed in the Appendix.

We are interested in solving the change in replacement rate as a response to the reform. Three groups experience different changes as a response to the PBD cut: 1) those with less than three years of work experience whose PBD is cut from 400 to 300, 2) three years or more work experience whose PBD is cut from 500 to 400 and 3) individuals over 58 years of age see no change in their PBD. In practice the percentage point change in the replacement rate for various groups are the following:

$$\begin{cases} d(rr^1) = rr^{UI} - \frac{300 \cdot rr^{UI} + 100 \cdot rr^{LMS}}{400} \\ d(rr^2) = rr^{UI} - \frac{400 \cdot rr^{UI} + 100 \cdot rr^{LMS}}{500} \\ d(rr^3) = 0, \end{cases} \tag{3}$$

4 Formally this can be seen as follows: Assume following empirical labor economic literature that probability of employment is exponentially distributed: p(a)=1-exp(-r*a), where a is search effort and r is the parameter that governs labor supply elasticity. Holding search effort constant, it is evident that probability of employment and labor supply elasticity have positive association: dp(a) = exp(-r*a)*r dr>0.

where rr^{UI} denotes the replacement rate of earnings-related unemployment benefit and rr^{LMS} denotes the replacement rate of labor market subsidy.

The idea is to apply equation (2) to the individual simulated replacement rates and to the individual duration of within year unemployment, which is observed in the data. The observed duration is then modified with the aid of equation (3) using the change in gross replacement rate and the individual semi-elasticity. The employment wage used is the one that is the basis of the unemployment benefit. Therefore, we assume that there is no wage-scarring effect.

6 EVALUATION OF THE REFORM

Table 3 (p. 13) summarizes the static effect of the reform on various population groups. The reform would directly affect approximately 39,000 unemployed which comprises 12 percent of all receivers of the earnings-related benefit. Individuals with lower PBD, i.e. modest work history, are affected approximately as much as those with longer history. The share of affected is similar between sexes. However, men have a larger drop in their disposable income, both in absolute and relative terms. This reflects mainly the differences in family types and wages.

The static reform impact is concentrated on the long-term unemployed, who are mostly located in the lowest income groups and oldest age groups. Around 32 percent of recipients in the lowest decile are affected whereas only five percent in the highest decile. The absolute decrease in disposable income is largest in the higher deciles while the relative decrease is largest among the lowest deciles. The impact among the very lowest deciles is cushioned by the increase of means-tested housing benefit and social assistance.

Only seven percent of the unemployed in the youngest age group (18–25) are affected by the reform whereas 16 percent of the unemployed aged 46–57 years. Most of the unemployed older than 58 years are exempted from the reform, only three percent being affected. Both absolute and relative decrease of disposable income is largest in older age groups.

When examined by family type, the reform concerns single adult households the most. Couples without children in their household are affected the least. Single parents in turn are affected most often. This is an interesting observation as from the earlier research it is known that the single parents are also facing the weakest financial incentives to work in Finland (see Kotamäki 2016).

Table 3. The static effect of the reform in subgroups of recipients of earnings-related unemployment benefit.

		Unaffected, N	Affected, N	Affected, %	Δ Disp. inc, €/year[a]	Δ Disp. inc, %[a]
	All	290,778	39,260	11.9	-479.9	-3.2
Potential duration	300/400 days	20,725	4,216	16.9	-315.7	-2.3
	400/500 days	213,325	35,044	14.1	-499.6	-3.3
(new/old)	500+ days	56,728	0	0.0		
Sex	Male	149,319	20,345	12.0	-602.4	-4.1
	Female	141,460	18,914	11.8	-348.1	-2.2
Decile	I	12,287	5,828	32.2	-428.3	-4.3
	II	24,774	6,847	21.7	-645.6	-4.9
	III	31,281	6,100	16.3	-692.4	-4.7
	IV	34,531	4,815	12.2	-518.6	-3.1
	V	36,222	4,156	10.3	-449.8	-2.4
	VI	36,562	3,523	8.8	-252.7	-1.2
	VII	35,869	2,818	7.3	-320.6	-1.4
	VIII	32,626	2,378	6.8	-302.9	-1.1
	IX	29,077	1,871	6.0	-223.6	-0.7
	X	17,548	926	5.0	-435.1	-0.9
Age	18–25	18,294	1,299	6.6	-222.1	-1.7
	26–35	62,895	9,164	12.7	-365.9	-2.5
	36–45	60,064	10,656	15.1	-466.4	-2.9
	46–57	82,974	16,023	16.2	-562.6	-3.7
	58–	66,551	2,118	3.1	-573.3	-4.2
Family type	Single dweller	66,664	10,283	13.4	-941.8	-6.8
	Single parent	18,747	3,703	16.5	-670.8	-3.5
	A couple	104,205	10,949	9.5	-282.7	-1.9
	A couple w / children	95,348	13,060	12.0	-202.3	-1.0

[a]Mean change in equivalized household income among the affected.

The above description addresses the static, i.e. immediate effect of the reform in subgroups. In the following, we consider the dynamic behavioral response jointly with the static effect. Four scenarios with elasticities of 0 (static), 0.4, 0.7 and 1.0 are presented, elasticity 0.7 being the baseline.

In Table 4 (p. 14), we present the estimated effects of the reform distinctly to different income units such as the two schemes of unemployment benefits, wage sum, tax revenue and means-tested benefits as well as the total impact on fiscal and household budgets. In all scenarios, the cut in PBD of earnings-related benefit is cushioned by the flat-rate unemployment benefit scheme, taxation and means-tested benefit. It logically follows from our assumptions that the wage sum increases in dynamic scenarios.

Table 4. The static and dynamic effects of the reform decomposed in different income units, million euros in 2016 price level.

	Pre-reform total, M€	Δ, static effect (elasticity 0)	Δ, dynamic effect Elasticity 0.4	Δ, dynamic effect Elasticity 0.7 (baseline)	Δ, dynamic effect Elasticity 1.0
Earnings-related UEB	2,552	-175	-196	-213	-230
Flat-rate UEB	1,859	+94	+84	+77	+70
Wage sum		0	+66	+118	+168
Taxes	33,483	-25	-19	-12	-5
Housing benefits	2,060	+7	+7	+6	+6
Social assistance	985	+3	+2	+2	+1
Total, fiscal		+48	+85	+116	+147
Total, households		-48	-18	+2	+21
UE days, all benefits	91,700,229	0	-572,406	-1,022,267	-1,457,176

In the government bill, the reform was expected to cut 159 M€ from the earnings-related unemployment benefit expenditure.[5] Static estimate presented in Table 4 is somewhat close to the target, 175 M€. The baseline dynamic effect, calculated with the elasticity of 0.7, exceeds the expected figure by 54 M€. In the baseline dynamic scenario, the aggregate tax accrual decreases 12 M€ compared to a 25 M€ decrease in the static simulation. Housing benefits and social assistance increase by 8 M€ in baseline scenario but 10 M€ in the static simulation. Overall, the positive effect on public finances more than doubles in the dynamic scenario compared to the static scenario.

As depicted in Table 5, the reform is estimated to result in a very marginal increasing effect on most inequality indicators. In the static scenario, Gini index increases by +0.02 and the general at-risk-of poverty rate +0.03 percentage points. The median equalized income in total population decreases marginally which results in slight decrease in relative poverty risk among the elderly, who are otherwise unaffected by the reform.

The inclusion of the baseline dynamic effect neutralizes the small static increase in the Gini coefficient. A similar pattern is also visible within the poverty risk indicators. The at-risk-of-poverty estimates increase by less in the baseline dynamic scenario compared to the static simulation.

5 See Government bill 113/2016.

Table 5. The static and dynamic effects of the reform on inequality indicators.

		Pre-reform	Δ, static effect (elasticity 0)	Δ, dynamic effect Elasticity 0.4	Elasticity 0.7 (baseline)	Elasticity 1
Gini index		26.65	+0.02	+0.01	0.00	0.00
At-risk-of poverty, % (60)	All	13.03	+0.03	+0.01	+ 0.01	0.00
	< 18 yrs	11.92	+0.02	+0.01	+0.02	0.00
	> 65 yrs	13.10	-0.03	-0.01	+0.00	+0.02
Median equivalized income (€/year)		23,770	-10	0	0	+10

The sensitivity analysis provides us with some interesting observations. With the higher elasticity, the Gini coefficient remains the same, implying no change in income inequality. Changes in the at-risk-of-poverty indicators grow smaller compared to the baseline dynamic scenario. The changes in the coefficients, however, are very small. With lower elasticity of 0.4 the inequality measures increase, reflecting a negative relation between the elasticity and inequality.

7 CONCLUSIONS

We presented the ex-ante estimated effects of a 2017 reform that cut the potential benefit duration of the unemployment benefit by 100 days in Finland. Our main results are as follows. Static simulation results in 81 M€ cut in unemployment insurance expenditures and 48 M€ overall after accounting for taxes and other benefits. Incorporating behavioral effects change the estimates drastically. The overall dynamic fiscal effect is +116 M€ and +2 M€ for the households given a labor supply elasticity of 0.7. The positive fiscal effect more than doubles and the negative effect on household income seen in the static scenario is neutralized.

Similar pattern is visible in inequality indicators. We observe that the PBD cut increases marginally the income inequality measured by the Gini coefficient when dynamic behavioral response is not included in the model. However, the inclusion of the behavioral response negates this increase; we observe no change in Gini coefficient when the increase in employment with 0.7 elasticity is considered.

Overall, the static simulation of the reform gives a somewhat pessimistic and modest picture of the reform. Including the dynamic effects improves the picture from both fiscal and household perspective. An interesting observation is that higher labor supply elasticities result in more favorable distributional effects. As a policy recommendation, benefit cuts should be targeted towards population groups with high labor supply elasticity to minimize the increase in inequality.

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APPENDIX: PREDICTING THE EMPLOYMENT PROBABILITIES

We conduct a naive estimation exercise using logistic regression analysis. The estimated regression equation is given by:

$$logit(E) = X'\beta,$$

where β denotes the vector of regression coefficients, X denotes the vector of explanatory variables and the logistic function of E is given by $log\left(\frac{p(e=1)}{1-p(e=1)}\right)$, where the event is becoming employed within the year of analysis.

We do not observe the unemployment spells in the data, only the number of unemployment days during 2014 and the unemployment status at the end of previous year 2013. By exploiting the unemployment information at the end of 2013, we can deduce the possible event of employment in 2014. Therefore, we concentrate the estimation on those who have been unemployed in the turn of the year and extend the prediction to all unemployed in earnings-related scheme. The event (e) is defined as follows:

$e = 0$ if the person is unemployed on 31 Dec 2013, receives earnings-related unemployment benefits in 2014 and receives no wage income in 2014

$e = 1$ if the person is unemployed on 31 Dec 2013 and receives wage income in 2014

Regression coefficients are reported in Appendix Table 1 and the distribution of predicted employment probabilities in Appendix Table 2 (p. 18).

Appendix Table 1. Logistic regression results.

	Coefficient	(S.E.)	Odds Ratio
Intercept	0.037	(0.172)	1.038
Education			
No post-basic level education or level of education unknown		ref	
Upper secondary education	0.246	(0.050)	1.128
Lowest level tertiary education	0.150	(0.058)	1.162
Higher tertiary or doctorate level	0.190	(0.071)	1.210
Number of children			
0		ref	
1	-0.032	(0.053)	0.968
2	-0.093	(0.074)	0.911
>2	-0.327	(0.158)	0.721
Sex			
Male		ref	
Female	-0.125	(0.033)	0.882
Coresidence status			
Single dweller		ref	
Couple	0.288	(0.035)	1.334
Age			
<25		ref	
25–29	-0.264	(0.172)	0.768
30–34	-0.362	(0.168)	0.696
35–39	-0.373	(0.168)	0.689
40–44	-0.447	(0.167)	0.639
45–49	-0.495	(0.166)	0.610
50–54	-0.582	(0.166)	0.559
>55	-0.709	(0.166)	0.492
Region			
Uusimaa		ref	
Varsinais-Suomi	0.154	(0.064)	1.167
Satakunta	0.209	(0.079)	1.233
Kanta-Häme	0.372	(0.104)	1.451
Pirkanmaa	0.144	(0.062)	1.154
Päijät-Häme	0.289	(0.088)	1.336
Kymenlaakso	0.412	(0.088)	1.510
Etelä-Karjala	0.193	(0.109)	1.212
Etelä-Savo	0.326	(0.102)	1.385
Pohjois-Savo	0.507	(0.081)	1.660
Pohjois-Karjala	0.311	(0.089)	1.365
Keski-Suomi	0.283	(0.071)	1.327
Etelä-Pohjanmaa	0.651	(0.094)	1.918
Pohjanmaa	0.359	(0.108)	1.432
Keski-Pohjanmaa	0.231	(0.156)	1.260
Pohjois-Pohjanmaa	0.346	(0.064)	1.413
Kainuu	0.397	(0.107)	1.487
Lappi	0.408	(0.083)	1.503
Ahvenanmaa	0.383	(0.414)	1.466

Appendix Table 2. The distribution of predicted employment probabilities.

Min	P10	P25	Median	P75	P90	Max
0.57	0.83	0.92	1.01	1.10	1.18	1.47