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Consumption and time use responses to unemployment

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Summary

Unemployment is a disruptive event in people's lives and often has major consequences for income and pension accrual. In this paper we analyze the effects of unemployment on consumption and time use. Can people partly absorb a drop in income because they have more time to dedicate to home production when they are unemployed? To what extent do these effects differ for younger and older workers? Insight into the consequences of unemployment is relevant for the pension sector. The draft legislation on Future Pensions states that pension providers must determine risk aversion and risk capacity every five years. Basic models often assume a certain future income. For young people, this means that pension assets can be invested in relatively high-risk stocks. In practice, however, people can become unemployed, and this flattens the optimal risk profile. Older employees who become unemployed are often out of work for long periods, which has a major impact on their income and pension accrual. This risk at the end of one's career influences the risk capacity and therewith the optimal risk profile for supplementary pensions.

We contribute to the international literature by examining the consequences of unemployment on different expenditure and time use categories. The results show that the effect of unemployment on total household expenditures is relatively low (a decrease of about 5%), whereas household income drops by approximately 20% when the leading income provider becomes unemployed. Expenditures for transport (-17%), domestic help (-15%), medical care (-53%), and donations (-17%) decrease significantly, while expenditures for utilities increase significantly (+7%). Expenditures for rent, mortgage, and food hardly change. In addition, we find a large increase in the time that people spend on leisure and household chores upon becoming unemployed. This increase is particularly large among older workers. In theory, this would enable them to absorb income shocks. However, we find no evidence that expenditures are actually replaced by home production. This limits the extent to which people can insure themselves against the negative income consequences of unemployment by home production. This flattens the optimal risk profile for supplementary pensions over the lifecycle, especially in sectors where the risk of unemployment is high.

Samenvatting

Werkloosheid is een ontwrichtende gebeurtenis in het leven van mensen, met vaak grote gevolgen voor het inkomen en de pensioenopbouw. In dit paper analyseren we het effect van werkloosheid op consumptie en tijdsbesteding. In hoeverre dalen werkgerelateerde uitgaven? En kunnen mensen een inkomens- daling deels opvangen omdat zij bij werkloosheid meer tijd hebben, zodat minder diensten uitbesteed hoeven te worden? In hoeverre zijn deze effecten verschillend voor jongere en oudere werknemers? Inzicht in de gevolgen van werkloosheid is relevant voor de pensioensector. In de ontwerpwetgeving Toekomst Pensioenen staat dat pensioenuitvoerders elke vijf jaar de risicobereidheid en het risico- draagvlak moeten bepalen. Basismodellen gaan vaak uit van een bepaald toekomstig inkomen. Voor jongeren kan het pensioenkapitaal dan heel risicovol belegd worden. In de praktijk kunnen mensen echter werkloos worden en dit vervlakt het optimale risico. Oudere werknemers die werkloos raken zijn vaak langdurig werkloos en dit kan grote gevolgen hebben voor hun inkomsten en pensioenopbouw. Dit risico aan het einde van de carrière beïnvloedt het risicodraagvlak van mensen, en daarmee ook het optimale risicoprofiel voor het aanvullende pensioen.

Internationaal gezien is het uniek dat we de gevolgen van werkloosheid op verschillende consumptiecategorieën en tijdsbestedingen kunnen onderzoeken. De resultaten laten zien dat het effect van werk- loosheid op huishouduitgaven relatief laag is (een daling van zo'n 5%), terwijl het huishoudinkomen zo'n 20% afneemt wanneer de kostwinner werkloos raakt. Uitgaven aan transport (-17%), huishoudelijke hulp (-15%), medische zorg (-53%) en donaties (-17%) nemen significant af, terwijl uitgaven aan gas, water en licht significant toenemen (+7%). Substantiële huishouduitgaven voor huur, hypotheek en voedsel veranderen nauwelijks. We vinden bij werkloosheid een grote toename in de vrije tijd van mensen en de tijd die besteed wordt aan huishoudelijke taken. Deze toename is vooral groot onder oudere werknemers. Zij zouden daarmee in theorie inkomensschokken kunnen opvangen. Echter, het deel van de uitgaven dat in de praktijk vervangen kan worden door 'home production' blijkt klein. Dit beperkt de mate waarin mensen zichzelf met behulp van extra tijd kunnen weren tegen de negatieve inkomensgevolgen van werkloosheid. Dit maakt het optimale risicoprofiel voor het aanvullend pensioen vlakker over de levenscyclus, vooral in sectoren waar de kans op werkloosheid groot is.

1. Introduction

Unemployment can occur anytime during the working life of an individual, can happen multiple times, and often has a detrimental effect on income and consumption (Stevens, 1997; Burdett et al., 2020). Most importantly, it can have permanent effects on income and consumption beyond the working life since individuals usually build a large share of their pension assets by paying premiums while employed. These long-term consequences can be intensified through the scarring effects of unemployment (Arulampalam, 2001) and the related loss of human capital (Burdett et al., 2020). In addition, prior literature has shown the importance of job uncertainty on asset allocation (Carroll et al., 2003; Cocco, 2005; Bremus & Kuzin, 2014; Bagliano et al., 2019). Unemployment can thus have important consequences for the capacity of individuals to build up pension assets, as well as on private savings and the optimal high-risk part of pension assets over the lifecycle. Job uncertainty flattens the optimal age profile of the optimal high-risk part of pension assets, but this depends on the ability of people to replace their expenditures by home production.

To prevent the negative effects of unemployment, households are often insured through formal risk sharing arrangements, such as unemployment insurance (UI) benefits, and/or informal risk sharing arrangements within households and across time, such as spousal labor supply and private savings (Hayashi et al., 1996; Lise & Yamada, 2019).[1]In this study, we contribute towards a more complete understanding of the effects of unemployment on the economic situation of individuals by investigating how it affects consumption and time use decisions. Consideration of the role of time use is very important because, in addition to a decrease in income, unemployment typically implies an increase in free time. This provides individuals with the possibility to insure themselves against the negative effects of unemployment on consumption by increasing the time that they dedicate to home production. This resource to mitigate the risks of unemployment is potentially important; however, it has hardly been explored in the literature so far.

According to the theory on the allocation of time by Becker (1965), households compensate de- creases in consumption expenditures by increasing the time that they dedicate to home production. In that way, they have access to a resource that provides insurance against income shocks by allowing smooth consumption over

1 Prior studies have investigated the role of UI benefits (e.g. Gruber, 1997), the role of spousal labor supply (e.g. Stephens, 2002; Hardoy, 2014; Cammeraat et al., 2019) and of private savings (Gallen, 2013; Michelacci & Ruffo, 2015; Basten et al., 2016) in smoothing consumption around unemployment.

time. For instance, Stephens (2004) shows substantial drops in food expenditures following unemployment, while Aguiar & Hurst (2005) find that much of this decrease is compensated by an increase in time spent cooking. In addition, Aguiar et al. (2013) find that every hour of decrease in working time due to unemployment is partially offset by a 20-minute increase of home production These results suggest that households resort to home production to compensate for the negative effects of unemployment on their economic and financial situation. However, Been et al. (2020) find that several expenditure categories are clearly not substitutable by home production. This makes one-to-one substitution between total expenditures and home production unlikely to hold and calls for an analysis using disaggregated expenditure and time use categories.

We contribute to the existing literature in three main ways. First, this is the first study that investigates the effects of unemployment by applying longitudinal micro data on disaggregated categories of both expenditures and time use.[2] Second, we explore the implications of our results for the calculation of relevant parameters usually employed in the lifecycle model; this further highlights the broader relevance of our results for the study of intra- and intertemporal decisions. Last but not least, whereas most related literature is based on American[3] or Canadian data,[4]this is the first paper to present evidence for the Netherlands. Labor market characteristics as well as the institutional context are important factors in determining how households are affected by unemployment. The Netherlands offers an institutional setting that is particularly relevant for this study and that is remarkably different from those usually explored in the literature.

The results we obtain show that, controlling for observable characteristics, unemployment leads to a decrease of about 10% in total expenditures. However, the effect is reduced to 5% when we control for unobserved heterogeneity using fixed effects; this is a rather small effect compared to what the literature typically suggests. This

2 Previous studies using expenditure data either use food expenditures only (Stephens, 2004; Aguiar & Hurst, 2005) or a wider but still limited range of categories (Gruber, 1998; Gerard & Naritomi, 2019). Other studies use detailed information on time use but lack information on expenditures (Krueger & Mueller, 2012; Aguiar et al., 2013; Griffith et al., 2016). Aguiar & Hurst (2005), Ahn et al. (2008), and Burda & Hamermesh (2010) use both expenditure and time use data. However, the data are cross-sectional, so that correlations can only be drawn based on comparison of employed and unemployed individuals.

3 For instance, see Dynarski & Sheffrin (1987), Gruber (1997), Stephens (2004), Aguiar & Hurst (2005), Krueger & Mueller (2012), Aguiar et al. (2013), Michelacci & Ruffo (2015), Kroft & Notowidigdo (2016), and Hendren (2017).

4 For instance, see Browning & Crossley (2001, 2008, 2009).

may partially be due to the generous Dutch UI benefit and/or due to the fact that a large percentage of expenditures falls into categories that are not easily adjustable (e.g. mort- gages, rent, and utilities). Most remarkably, we do not find significant effects on expenditure categories that could be replaced by home production, such as house cleaning and gardening, eating outside the home, and child care. This contrasts with the fact that we do find a very strong and statistically significant increase in time spent on household chores. This effect is especially strong for individuals above the age of 50. An analysis of time use subcategories reveals that the increase in time spent on household chores mostly relates to house repairs, gardening, and cooking.

These results indicate that the Dutch context includes individuals with enough resources to maintain their consumption levels when becoming unemployed. In addition, they indicate that Dutch households are flexible in the sense that they can increase the time that they dedicate to home production when unemployed. This characteristic constitutes an additional resource in making households potentially more resilient to events that may lead to relevant drops in income, e.g. unemployment, disability, retirement, or changes in family structure. Ap plying the empirical results to a formal lifecycle model confirms that there is low substitution between expenditures and home production during unemployment. In addition, it shows that individuals strongly attach to smoothening their leisure and consumption over time.

Overall, our results indicate that unemployment does not seriously affect the economic situation of Dutch households in terms of current consumption (-5%). Household income, however, drops by about 20%. The results show that especially older unemployed individuals are flexible in adapting their use of time; this should make them resilient to potential drops in income. However, we find no clear evidence of substitution between expenditures and home production. These are important aspects for pension providers when it comes to determining the risk capacity of individuals under the new Dutch pension contract. Especially in sectors with a high probability of unemployment, this flattens the risk profile over the lifecycle.

The remainder of the paper is structured as follows. Section 2 explains how the UI benefit system operates in the Netherlands. Section 3 explains the empirical strategy. Section 4 presents the data. Section 5 presents the estimation results. And Section 6 rounds up the paper with a conclusion. Additional summary statistics and empirical results are provided in Appendix A, while Appendix B discusses the theoretical implications of our results.

2. Institutional Context

As described by the OECD (2019b), the Netherlands has a relatively generous unemployment insurance (UI) benefit system. However, the system also contains a set of rewards and punishments meant to provide individuals with the incentive to actively search for employment while receiving benefits. In this section we briefly explain how the system works, since it is very relevant for understanding the effects of unemployment.

Employees in the Netherlands have the right to claim UI benefits if they worked at least 26 of the last 36 weeks and are not considered to blame for the job loss. The duration of UI benefits depends on the employee's work history. Until 2016, the minimum duration was three months, and this was extended by one month for every year worked, up to a maximum of 38 months for those who worked at least four out of the last five years. As from 2016, the maximum of 38 months has been reduced to 24 months. The accumulation of months has also become less generous: one month for every year of the first 10 years of work and half a month for every year of work beyond 10 years. In all cases, receipt of UI benefits is conditional on strict mandatory job search requirements, the fulfillment of which is monitored weekly by the unemployment service.

For the first two months of unemployment, the UI benefits replace 75% of the last earnings, with an absolute maximum of €3,100.[5] After these two months, the replacement rate is lowered to 70% of the last earnings, with a maximum of €2,900. Prior to 2016, the replacement rate was 70% for the total duration of UI benefits. Upon job loss, contributions to occupational pensions are automatically stopped or reduced, depending on the sector's collective agreement. When UI benefits are exhausted, individuals can claim asset- and income-based means-tested welfare benefits that guarantee a minimum standard of living. Also, older individuals can apply for additional benefits that are only income-dependent.

From an international perspective, the Dutch net replacement rate for the first two months of job loss is one of the highest among OECD countries. It is 30, 40, and 15 percentage points higher than in the U.S., the U.K., and Germany respectively (OECD, 2019a). The replacement rate after the 2nd and until the 24th month is still relatively generous (it is 65, 35, and 35 percentage points higher than in the U.S., the U.K., and Germany respectively). However, after 24 months, the generosity of UI benefits in the

5 In a few sectors, collective agreements require employers to complement UI benefits to a 100% replacement rate.

Netherlands drops very substantially compared to other countries. Therefore, despite a relatively generous replacement rate, job loss can have severe consequences for the current and future income level of Dutch households.

The above effects of unemployment on the contributions by individuals to their occupational pension are somewhat mitigated by the presence of a state pension that provides a strong social assistance component. For every year that an individual lives and/or works in the Netherlands after the age of 15, that person accumulates 2% of the full state pension amount. This full amount is linked to the minimum wage and is conditional on the presence of a partner in the household with a state pension entitlement. In this way, the state pension guarantees a level of financial security even when individuals are faced with the risk of unemployment. However, an important percentage of the total pension income of Dutch individuals comes from the occupational pension, as this contributes very substantially to financial security on top of the state pension.[6] Therefore, the effect of unemployment can be particularly severe when we consider how it affects the lifelong earning capacity of individuals and thus their capacity to build pension income as well as private savings.

6 As shown by Knoef et al. (2016), occupational pensions make up about 35% of the retirement income of the median household. This means that for 50% of the population that share is above 35%.

3. Empirical Strategy

To estimate the effects of unemployment on time use and consumption we followed the previous literature (e.g. Stephens, 2004; Aguiar & Hurst, 2005; Krueger & Mueller, 2012; Aguiar et al., 2013) and set up the equation

$$Y_{it} = \beta_0 + \beta_1 UNEMP_{it} + \beta_2^{\prime} \mathbf{X}_{it} + \beta_3^{\prime} \mathbf{t}_t + \alpha_i + \varepsilon_{it}, \quad (3.1)$$

where Y_{it} denotes a particular expenditure or time use category for individual i at period t; $UNEMP_{it}$ is a dummy variable, with value one if the individual is unemployed; $\mathbf{X}_{it}$ is a vector of control variables including gender, age, presence of a partner, number of children in the household, and educational level; $\mathbf{t}_t$ is a vector of year dummies; and $\alpha_i + \varepsilon_{it}$ is the composite error term, where α_i is an individual effect and ε_{it} captures unobserved variation across individuals and over time. The coefficient of interest is β_1, which, depending on the expenditure or time use category analyzed, is expected to be either positive or negative.

We first estimated β_1 by pooled OLS, which exploits variation both between and within individuals.

These estimates are comparable to those applied in Ahn et al. (2008) and Burda & Hamermesh (2010) in that they rely on comparing individuals who are unemployed with those who are employed. They cannot be interpreted causally and we provide them for the purpose of showing how unemployment correlates with the expenditure and time use categories that we analyze. Secondly, we re-estimated β_1 by including individual fixed effects in our regressions. In this way, we control for unobserved individual heterogeneity that is fixed over time, which in Equation 3.1 is represented by α_i. These estimates are comparable to those in Krueger & Mueller (2012) in that they rely only on variation within individuals over time.

The specification in 3.1 may underestimate the effect of unemployment in case individuals are able to anticipate their unemployment. However, if we account for expectations using the approach proposed by Stephens (2004), we find that the effects of expected and unexpected job losses are not significantly different from each other.[7] In addition, when estimating β_1 by fixed effects, note that we implicitly assume symmetry between the effects of transitions into unemployment (job loss) and transitions out of unemployment (job find). To test the validity of this assumption

7 The estimation results accounting for expectations are provided in Table A.7. We refer again to these results in Section 5.1.

we also estimate the effects of both transitions separately. The results show differences that are not statistically significant for virtually all categories of expenditures and time use. Therefore, we rely on the assumption of symmetry for all results that we present here.[8]

As an extension of our baseline analysis, we considered interactions between unemployment and educational level, net household income, and age. It is relevant to consider interactions with educational level and income because, on the one hand, individuals with higher education and/or higher income are more likely to rely on occupational pensions and private savings. On the other hand, individuals with lower education and/or lower income are more likely to rely on the state pension; thus their accumulation of wealth over the lifecycle is less likely to be affected by unemployment spells. In addition, age is a relevant factor since older workers are likely to respond different from younger workers. That is because of the savings that they may already have built up and the different prospects of re-employment that they face once unemployed.

8 We test for symmetry by rewriting Equation 3.1 in first differences and substituting the unemployment dummy for two dummies that indicate job loss and job find, respectively. The cases for which there is no labor market transition constitute the reference category. Considered in terms of absolute value, the estimates for the job loss and job find dummies are very rarely significantly different from each other, and then only at low levels of significance.

4. Data and Descriptive Statistics

To implement the empirical strategy, we used data from the Longitudinal Internet Studies for the Social Sciences (LISS), administered by CentERdata at Tilburg University. The LISS Core Study provides information on a wide range of topics for a sample that is representative of the Dutch population, and that has been conducted every year since 2007. The 2009, 2010, 2012, 2015, 2017, and 2019 waves were supplemented with an additional module on time use and expenditures. We used these six waves in the analysis. The number of observations was very comparable across the six waves.

We selected household heads in the 25 to 64 years age category, whose labor market status is either employed or unemployed, and without missing data on expenditures and time use.[9]In addition, we eliminated observations that are in the top percentile of any expenditure or time use category. In that way, we excluded a few observations with unreasonably high values. This left us with a sample for the expenditure analysis of 4,781 household heads and 12,141 household-year observations. For the time use analysis, the sample contains 3,673 household heads and 8,807 household-year observations. This difference is due to a larger number of missing values for the time use data. Tables A.1 to A.5 in Appendix A provide summary statistics for all variables that we employ in the analyses.

4.1 Unemployment

In our sample we considered an individual to be employed if he/she reported being employed on a paid basis, working in a family business, or being self-employed. We considered an individual to be unemployed if the person reported to be looking for a job after an involuntary job loss or was a first-time job seeker. With this definition we found an average unemployment rate of 3.92% for the full sample period, ranging between 2.06% for the year 2009 and 5.96% for the year 2015.[10]

Since the fixed effects analysis relies on variation within individuals over time, it requires that they transit from employment to unemployment and vice-versa during the period that we observed them. Of the 4,781 household heads in the sample for the expenditure analysis, 3,039 (63.56%) were observed for at least two periods. Of these, 177 (5.82%) experienced a transition into unemployment during the period of observation, meaning that they lost their job between waves $t-1$ and t while being

9 In case there is more than one adult in the household, the one with the highest personal income is considered the household head.

10 In this section we report statistics that relate only to the sample for the expenditure analysis. The statistics are highly similar for the time use sample.

observed in both waves. In addition, 127 (4.18%) experienced a transition from unemployment to employment.

4.2 Expenditures

The data on expenditures were collected by means of retrospective questions about money spent on a number of categories. The LISS distinguishes between expenditures at the household level and expenditures at the individual level. The household level categories are mortgages, rent, utilities, transport, insurance, alimony, debts and loans (other than mortgages), house and garden cleaning, food at home, child care, vacations, and other. The individual level categories are eating out, tobacco, clothes, personal care, medical care, leisure, schooling, donations, and other. For all categories, respondents were asked to report the amount spent on average per month, taking the past 12 months as reference period. The LISS expenditure data do not include information on durable consumption goods. Therefore, we consider only expenditures on non-durable goods and services.

Since it is actually rather difficult to draw a line that separates individual level from household level expenditures, we added up all responses to the individual categories within a household and thus considered them at the household level as well. We deflated all categories using the consumer price index, and added household and individual categories together to obtain a measure of total household expenditures. Unfortunately, the categories reported at the individual level were only available for the 2009, 2010, and 2012 waves. For the remaining waves, namely 2015, 2017, and 2019, the LISS only provided the total of individual expenditures for each household member without a breakdown by category. This still allowed us to calculate total household expenditures for all years we observe.

Pooling all waves together, average total non-durable household expenditures in the sample was €2,122 per month. Of this, 81.08% corresponds to the categories considered at the household level by the LISS. Among these categories, those with the largest percentage of total expenditures were mortgages (21.46%) and food at home (15.08%), followed by insurance (9.32%), utilities (8.53%), transport (6.22%), trips and vacations (5.30%), rent (5.23%), other (4.40%), house and garden cleaning (1.75%), debts and loans (1.44%), daycare (1.24%), and alimony (0.82%). Pooling the first three waves together, the individual-level category with the largest percentage of total average expenditures was clothes (4.80%), followed by eating out (2.88%), leisure (2.72%), donations (2.19%), personal care (1.93%), medical care (1.10%), tobacco (0.95%), other (0.70%), and schooling (0.51%).

4.3 Time Use

As to the time use data, the LISS module on time use and consumption asked respondents about the number of hours spent during the last week on a range of activities. These are paid work, commuting to work, household chores, activities with children, helping parents, helping other family members, helping non-family members, leisure activities, sleeping and resting, schooling, personal care, and administrative chores. Activities may take place simultaneously. The first six categories, i.e. from paid work to helping non-family members, were provided in all waves. The rest were provided only in the first three waves and in the last one, i.e. the waves in 2009, 2010, 2012, and 2019, except for the categories personal care and administrative chores, which were only available in the first three waves.

Pooling all available waves together, the most common activities besides paid work are sleeping and resting (58.01 hours per week on average) and leisure activities (32.14), followed by household chores (10.33), personal care (8.33), activities with children (4.53), commuting to work (4.43), informal care (3.35),[11] administrative chores (2.84), and schooling (1.54). In addition to the module on time use and consumption, the LISS provides a yearly module on social integration and leisure, which contains information on subcategories of home production and leisure. We used these subcategories to expand the baseline analysis, which focuses on the more general abovementioned time use categories.

11 Informal care is the additional time spent helping parents, other family members, and non-family members.

5. Estimation results

5.1 Expenditures

Tables 1 and 2 present the estimates of β_1 in Equation 3.1 for the expenditure categories reported at the household level and the individual level, respectively. In addition, Table 1 provides the results for total expenditures. In both tables, column 1 provides the OLS estimates without any control variables, column 2 provides the OLS estimates when including the control variables and the vector of time dummies, while column 3 provides the estimates obtained when including individual fixed effects in the model.[12] The first row in Table 1 shows that, regardless of the estimation method used, we find a negative effect of unemployment of the household head on total household expenditures. Column 1 shows that households where the household head is unemployed spend €454.57 less per month on average than households where the household head is employed. That is about 21% of average total expenditures. Controlling for observed characteristics lowers the decrease to about 9% of total expenditures, while controlling for unobserved heterogeneity via a fixed effect lowers it to about 5%. These results mean that the drop in total household expenditures is in all cases less than the drop in income imposed by the Dutch UI benefit system upon an individual becoming unemployed, i.e. 30%.[13]

Following the logic behind the theory of Becker (1965) on the allocation of time, we would expect to find declines in those expenditure categories that are most easily substituted by home production. These are house and garden cleaning, eating out, and child care. However, the fixed effects estimation shows no clear effect for eating out and child care. For house and gardening cleaning we find a significant decline of €5.43 per month. Furthermore, when re-estimating Equation 3.1 using the sum of these three categories as a dependent variable, we estimate an effect of -9.20 (-4.56) euros with OLS controlling for observables (fixed effects). This estimate is not significantly different from zero and represents only 7.24% (3.59%) of the mean of the dependent variable.

As to other expenditure categories, we do find a clear negative effect on transport expenditures, very likely reflecting the complementarity between working and commuting. Unemployment reduces transportation expenditures on average by about 22 euros per month. For utilities we find a weak positive effect in the FE specification,

12 All estimates are robust to application of Bonferroni Multiple Hypothesis Testing.

13 For high income individuals the replacement rate is lower. Furthermore, at the household level, losses are smaller due to income pooling. There is no evidence of an added worker effect in the Netherlands (De Nardi et al., 2021).

Table 1: Results – Total and Household Level Expenditures (euros per month)

Dep. variable	Mean	(1) OLS-1	(2) OLS-2	(3) FE
Total	2,122.39	-454.57***	-207.76***	-110.21*
		(58.96)	(53.61)	(63.81)
Mortgage	455.50	-217.17***	-117.05***	19.94
		(23.31)	(21.88)	(20.35)
Rent	111.00	115.03***	78.39***	-16.04
		(14.76)	(14.32)	(10.97)
Utilities	181.08	0.89	5.75	12.93*
		(6.03)	(5.84)	(7.02)
Transport	132.11	-36.03***	-25.48***	-22.17***
		(5.58)	(5.24)	(7.05)
Insurances	197.80	-27.53***	-17.14**	-5.77
		(7.58)	(7.13)	(9.63)
Alimony	17.43	-6.26**	-9.59***	-3.86
		(2.77)	(2.90)	(4.25)
Debts and loans	30.62	8.80*	7.91	-8.38
		(5.32)	(5.43)	(6.39)
House cleaning	37.24	-12.01***	-8.31***	-5.43*
		(2.12)	(2.09)	(3.21)
Food in	320.05	-64.40***	-26.57***	-16.35
		(10.73)	(9.66)	(11.48)
Childcare	26.27	-20.74***	-2.55	-2.13
		(3.01)	(3.13)	(5.76)
Holidays	112.52	-50.73***	-18.01***	2.22
		(7.82)	(6.89)	(10.53)
Other	93.39	-26.63***	-23.98***	-14.22*
		(5.16)	(5.18)	(7.72)

Notes: Standard errors (clustered at the household level) are reported in parentheses. The number of observations in all regressions is 12,141. All regressions except those in column 1 include gender, age, presence of a partner, number of children in the household, educational level, and a set of year dummies. See main text for further details. *Significant at the 10% level, **significant at the 5% level, ***significant at the 1% level.

probably related to spending more time at home. For the rest, the estimated effects become rather small and hardly significant in all cases once we control for unobserved heterogeneity. That is the case even when several of these categories, i.e. mortgages, rent, and food at home, represent a substantial percentage of total expenditures. This may reflect the fact that categories such as mortgages and rent are often subject to long-term contractual agreements. This implies that a substantial fraction of the total

Table 2: Results – Individual Level Expenditures

Dep. variable	Mean	(1) OLS-1	(2) OLS-2	(3) FE
Food out	63.57	-6.54	-3.25	5.34
		(7.04)	(7.10)	(9.15)
Tobacco	21.00	3.08	1.08	-3.65
		(3.34)	(3.38)	(4.45)
Clothing	105.92	-20.37**	-7.27	-4.61
		(9.12)	(8.75)	(10.38)
Personal care	42.53	-1.03	1.64	1.08
		(3.67)	(3.54)	(5.46)
Medical care	24.28	3.16	2.81	-12.79**
		(3.38)	(3.31)	(5.77)
Leisure	59.96	-10.60**	-6.52	-10.19
		(4.87)	(4.80)	(6.62)
Schooling	11.27	-1.33	0.39	1.36
		(3.13)	(3.11)	(6.08)
Donations	48.23	-9.38**	-6.52	-8.41*
		(4.51)	(4.43)	(4.87)
Other	15.45	-2.30	-2.52	-2.04
		(1.84)	(1.92)	(4.14)

Notes: Standard errors (clustered at the household level) are reported in parentheses. The number of observations in all regressions is 5,969. All regressions except those in column 1 include gender, age, presence of a partner, number of children in the household, educational level, and a set of year dummies. See main text for further details. *Significant at the 10% level, **significant at the 5% level, ***significant at the 1% level.

expenditures of households cannot be easily adjusted.[14] As suggested by Chetty & Szeidl (2007, 2016), this may well explain much of the absence of a larger response of expenditures to unemployment.

As mentioned in Section 3, one reason why we do not observe large changes in expenditures may be that individuals partly expect unemployment and thus already adjust their expenditures before it takes place. To check this, we use an LISS question that asks individuals about the probability of a job loss during the coming 12 months, and we apply the approach by Stephens (2004) to isolate the expected and

14 Households could adjust these expenditures by moving house upon becoming unemployed. However, we find that the correlation between job loss and moving is only 0.010. In line with this, when we regress the probability of moving on a dummy indicator, we find a very small effect that is not statistically significant.

unexpected components of a job loss.[15] As this approach requires first taking differences for the dependent variable, and as there is a significant fraction of individuals who do not report job loss expectations, the number of observations in the sample drops to 6,591. Column 1 of Table A.7 in Appendix A shows that the immediate effect of a job loss is a €262.55 decrease in household expenditures. This effect becomes larger when we consider only the unexpected component of the job loss, i.e. the job loss shock. However, columns 2 to 4 of Table A.7 show that the effects of unexpected and expected job loss are not significantly different from each other.

An additional reason for the lack of a clear effect of unemployment on expenditures could be an only small change in net income as a consequence of unemployment. Net household income may change by less than imposed by the UI benefit replacement rate, because upon unemployment individuals may become eligible for additional subsidies and transfers (e.g. rent subsidy or health insurance subsidy). In addition, spousal income may contribute to a smaller drop in net income at the household level. To assess the relevance of this possibility, we ran a regression using the same specification as in Equation 3.1 but using monthly net household income as a dependent variable. We estimate a drop in income of €417.04 as a consequence of unemployment, while the pre-unemployment average is €2,193.92. This means that household net income drops by approximately 20% when the household head becomes unemployed. This is less than the drop imposed by the UI benefit replacement rate (30%). This means that, on top of the replacement rate, the resources to reduce the drop in income mentioned potentially play an important role in the lack of a strong response in consumption.

5.2 Time Use

Table 3 presents the estimation results of the effect of unemployment on the time use categories contained in the module on time use and consumption within the LISS. As expected, we find that unemployment has a substantial negative effect on hours dedicated to paid work. Depending on the empirical specification, the estimated effect on working hours is between 20 and 28 hours per week. This effect is less than the fulltime 40 hours per week since our sample includes individuals who work

15 This approach consists of using the difference between a dummy that indicates job loss between t and t-1 and the self-reported job loss probability at t-1 to identify the unexpected component of a job loss. To identify the expected component of a job loss, we use the probability reported at t-1 in case of a job loss at t. Following Stephens (2004), these regressions are estimated first taking differences, and we only control for age and changes in household composition. Similar to Stephens (2004), we find that self-reported job loss expectations have significant predictive power.

Table 3: Results – Time Use

Dep. variable	Mean	(1) OLS-1	(2) OLS-2	(3) FE
Paid work	34.13	-27.69***	-25.69***	-20.94***
		(0.83)	(0.82)	(1.38)
Commuting	4.43	-3.10***	-2.68***	-2.84***
		(0.18)	(0.18)	(0.28)
Household chores	10.33	6.47***	5.74***	5.39***
		(0.84)	(0.82)	(1.08)
Activities with children	4.53	-0.91	1.35***	0.48
		(0.62)	(0.49)	(0.38)
Informal care	3.19	2.53***	2.24***	0.19
		(0.47)	(0.46)	(0.56)
Leisure activities	32.14	8.72***	6.33***	10.50***
		(1.67)	(1.64)	(2.45)
Schooling	1.54	0.40	0.52	0.63
		(0.41)	(0.42)	(0.67)
Sleeping and resting	58.01	2.02*	1.30	0.59
		(1.11)	(1.12)	(1.67)
Personal care	8.32	2.63***	2.19***	0.32
		(0.59)	(0.61)	(0.75)
Administrative chores	2.83	1.38***	1.24***	-0.43
		(0.40)	(0.39)	(0.47)

Notes: Standard errors (clustered at the household level) are reported in parentheses. Regressions for paid work, commuting, activities with children, and informal care include 8,807 observations. Regressions for household chores, leisure activities, schooling, and sleeping and resting include 5,538 observations. Regressions for per- sonal care and administrative chores include 4,330 observations. All regressions except those in column 1 include gender, age, presence of a partner, number of children in the household, educational level, and a set of year dummies. See main text for further details. *Significant at the 10% level, **significant at the 5% level, ***significant at the 1% level.

parttime, as well as un- employed individuals who report hours of paid work.[16] In addition, we estimate a substantial drop in time spent commuting owing to unem- ployment. The fixed effects estimate indicates a difference of almost three hours, i.e., about 64% of the average in the sample. This result is in line with the drop in transport expenditures reported in Table 1. It also implies a substantial increase in the number of hours that are freed up as a result of the reduction in working hours when unemployed.

16 The sample average of reported weekly hours of paid work is 35.36 for employed individuals, while it is 7.67 for unem- ployed individuals. The difference between these two averages is the estimate reported in column 1 of Table 3, i.e. -27.69.

Table 3 shows a substantial increase in the time spent on household chores.[17] More specifically, column 3 shows that unemployment leads to an average increase in household chores by about 5.5 hours per week (53% of the average in the sample). This implies that home production absorbs about one fourth of average lost working hours. Although slightly lower, this result is comparable to that reported by Aguiar et al. (2013) based on state-level variation in the US. Categories such as activities with children and informal care (within the household) could also be considered as home production, because of the possibility to substitute these activities with paid child care and formal care, respectively. However, even though columns 1 and 2 report significant effects of unemployment on these categories, accounting for unobserved heterogeneity renders the effects small and statistically insignificant.

Table 3 also reports a substantial increase in time allocated to leisure during unemployment. More specifically, column 3 reports an increase of 10.50 hours per week (32.67% of the average). This implies that leisure accounts for about 50% of average lost working hours, while leisure and home production together account for about 75%. This substantial increase in time devoted to leisure, combined with the lack of increases in leisure-related expenditure categories reported in Tables 1 and 2, suggests that leisure and expenditures are not complementary for the unemployed.

As mentioned in Section 4.3, as part of its core study the LISS provides a module on social inte- gration and leisure that contains the subcategories home production and leisure. This module has been run every year since 2008 up until 2018. It therefore provides a much broader sample than the samples used for the analyses in Tables 1 to 3. The number of household-year observations increases in this case to 15,454. Out of all the time use categories reported in this module, we provide the results for four categories related to home production (small jobs in and around the house, caring for plants or animals, cooking, and shopping), seven related to leisure time (sports, watching TV, listening to the radio, reading, listening to music, going out, and volunteering), plus an additional category that includes all other categories reported in this module.[18] Same as for the time categories in Table 3, time spent in these categories is provided in hours per week.

17 Household chores include several activities usually classified as home production. When answering this question, the LISS respondents were asked to think about cleaning, cooking, laundry, shopping, and gardening.

18 These 15 other categories mostly relate to leisure and include activities such as playing an instrument, photography, collecting, playing cards, and fishing. Each of these activities accounts for less than a quarter of an hour a week on average. Therefore, we do not report them separately.

Table 4: Results – Time Use (Additional Categories)

Dep. variable	Mean	(1) OLS-1	(2) OLS-2	(3) FE
Small house jobs	2.97	0.71***	0.71***	0.66***
		(0.27)	(0.27)	(0.25)
Caring for plants/ animals	1.80	0.66***	0.52**	0.59**
		(0.23)	(0.24)	(0.24)
Cooking	2.68	1.25***	0.89***	0.59***
		(0.22)	(0.21)	(0.15)
Shopping	1.08	0.31***	0.23**	0.10
		(0.10)	(0.10)	(0.09)
Sports	1.94	-0.06	0.04	0.29***
		(0.14)	(0.14)	(0.10)
Watching TV	17.53	6.29***	5.42***	3.88***
		(0.78)	(0.76)	(0.56)
Listening to radio	18.03	0.86	0.49	-0.13
		(1.25)	(1.24)	(1.02)
Reading	2.75	1.13***	0.82**	0.81***
		(0.37)	(0.35)	(0.27)
Listening to music	9.65	1.87**	1.42*	-0.30
		(0.88)	(0.85)	(0.68)
Going out	1.19	-0.03	-0.06	0.12
		(0.11)	(0.11)	(0.10)
Volunteering	1.10	0.86***	0.91***	0.75***
		(0.23)	(0.23)	(0.21)
Other activities	1.87	0.51***	0.47***	0.78***
		(0.17)	(0.17)	(0.17)

Notes: Standard errors (clustered at the household level) are reported in parentheses. The number of observations in all regressions is 15,454. All regressions except those in column 1 include gender, age, presence of a partner, number of children in the household, educational level, and a set of year dummies. See main text for further details. *Significant at the 10% level, **significant at the 5% level, ***significant at the 1% level.

Column 3 of Table 4 shows that the increase in home production due to unemployment reported in column 3 of Table 3 partially comes from increases in small jobs in and around the house,[19] caring for plants and animals, and cooking, while shopping seems to be unimportant. These three categories together account for an increase of 1.84 hours a week, which is still only one third of the increase in household chores reported in Table 3 (5.34). This means that there are other potentially relevant subcategories of home production that the LISS does not measure separately. House cleaning

19 It is unclear which activities are captured by this first category. It probably includes home repairs and improvements.

is likely to be the most important missing category. In addition, the results in Table 4 indicate that much of the increase in leisure time relates to time spent watching TV. Time dedicated to sports, reading, volunteering, and other activities also increase during unemployment. However, together they account for less than one third of the increase in leisure time reported in Table 3, while watching TV alone accounts for over a third of that increase.

All in all, our estimates of the effect of job loss on expenditures and time use suggest that there is hardly any interaction between expenditures and time use. Although leisure time increases, we find no substantial increases in leisure expen- ditures. Similarly, although home production increases, we find no substantial decreases in expenditure categories that can be replaced by home production. Therefore, the small decrease in consumption upon unemployment is likely to be a consequence of both generous UI benefits and less saving (or more uptake of savings) to retain the same consumption level.

5.3 Interaction Effects

Table 5 provides the results that we obtain when interacting unemployment with education, net household income, and age. As explained in Section 4.1, we observe relatively few transitions into and out of unemployment. Therefore, we face a trade- off between the level of granularity in the heterogeneity effects and the statistical power available to estimate these effects. To deal with this, we consider only two categories within each interaction variable. For education we create a dummy that takes value one for individuals with a university degree; for income we create a dummy that takes value one for those in the top half of the net household income distribution (previous to unemployment); for age we create a dummy for those above 50 years of age. Furthermore, in this part of the analysis we focus specifically on total expenditures, the sum of expenditures that are substitutable for home production (house and garden cleaning, eating out, and childcare), and the variable that mea- sures time spent on household chores. We focus on these variables here since they are the most relevant to assess the role of home production as an insurance against the risks of unemployment.

Panel *(a)* of Table 5 shows no significant effects of unemployment on total and substitutable expen- ditures both for individuals with lower and higher education. The point estimate for the total expenditures of those with higher education is rather large (€-248.87). However, average expenditures for this group also con siderably higher (€2,724.27). Regarding time spent on household chores, we find significant effects for both groups, but these are not significantly different from each other. Panel

Table 5: Results – Interaction Effects

(a)	Lower Educated		Higher Educated	
Dep. variable	Mean (1)	FE Estimate (2)	Mean (3)	FE Estimate (4)
Total expenditures	2,090.17	−96.56	2,724.27	−248.87
		(71.97)		(156.80)
Subst. expenditures	138.49	0.00	223.01	−12.70
		(14.94)		(54.87)
Household chores	10.06	4.25***	9.11	6.91*
		(1.02)		(3.64)
(b)	Lower Income		Higher Income	
Dep. variable	Mean (1)	FE Estimate (2)	Mean (3)	FE Estimate (4)
Total expenditures	1,820.28	−214.69**	2,671.49	−131.09
		(85.37)		(141.25)
Subst. expenditures	109.14	−7.48	202.05	−18.64
		(10.67)		(31.04)
Household chores	10.06	3.96***	9.60	4.73*
		(1.38)		(2.67)
(c)	Age≤50		Age>50	
Dep. variable	Mean (1)	FE Estimate (2)	Mean (3)	FE Estimate (4)
Total expenditures	2,264.72	−65.83	2,070.60	−146.24*
		(111.31)		(78.77)
Subst. expenditures	171.33	14.84	118.23	−13.22
		(26.61)		(15.36)
Household chores	9.06	0.47	11.15	7.16***
		(1.40)		(1.28)

Notes: Standard errors (clustered at the household level) are reported in parentheses. For total expenditures the sample is the same as in Table 1, for substitutable expenditures the sample is the same as in Table 2. For household chores the sample is the same as in 3. Higher educated means having university education, and higher income is defined as being in the upper half of the net household income distribution. See main text for further details. *Significant at the 10% level, **significant at the 5% level, ***significant at the 1% level.

(b) shows that, for households with income in the lower half of the distribution, the effect of unemployment on total expenditures is rather large. The estimate is €−214.69, representing about 12% of average expenditures for that group, and is significant at the 10% level. This effect suggests that individuals with a lower income may have less savings to self-insure against unemployment. However, same as in Panel *(a)*, the difference between the two groups is not statistically significant. This is also the case for substitutable expenditures and time spent in household chores in Panel *(b)*.

Regarding Panel *(c)*, we also find no significant differences in the effects on expenditures between the two age groups that we consider. However, in this case we

do find a clear and statistically significant difference when it comes to time spent on household chores. More specifically, we find that, for the group aged 50 or below, there is a negligible effect of unemployment on time spent on household chores, not significantly different from zero. However, for the group aged above 50, we find a very strong and significant positive effect. For this group, time spent on household chores increases by 7.16 hours (about 64% of the average for that group) as a response to unemployment. This result suggests that especially older individuals increase home production as a response to unemployment. This is an important finding since it indicates that individuals who are close to retirement can easily resort to increasing their home production. This resource makes them more resilient to a potential drop in income upon retirement. However, this evidence does not allow us to conclude that there is substitution between expenditures and home production.

6. Conclusion

In this study we have used Dutch micro panel data that contain detailed information on a wide variety of ex- penditure and time use categories, to analyze the effects of unemployment on time use and consumption. This is a relevant exercise since it provides insight into the economic effects of unemployment on households, as well as into their capacity to self-insure by resorting to home production. Controlling for unobserved heterogeneity, we find that total household expenditures drop by about 5% upon unemployment of the household head. This effect is smaller than what the literature typically suggests. The absence of a larger response may be due to the fact that the UI benefit system in the Netherlands, described in Section 2, is rather generous. It may also reflect the fact that a few categories that constitute a large percentage of expenditures are subject to long-term contractual agreements and thus cannot be easily adjusted, i.e. mortgages and rents, as suggested by Chetty & Szeidl (2016).

Interestingly, we do not discover clear unemployment-related declines in expenditure categories that can potentially be substituted by home production, i.e. house cleaning, childcare, and eating out, while we do find a clear increase in time dedicated to household chores. The latter increase accounts for about one fourth of average lost working hours. An analysis by age shows that this increase is due to the effect on individuals who are 50 years or older. Even if we do not observe substitution between expenditures and home production, the increase in home production means that older Dutch households do have flexibility to increase the hours dedicated to home production when their time budget increases. This is an important result since it indicates that they can use this resource to mitigate the potentially negative effects of events that cause a drop in income, e.g. disability, retirement, or changes in family structure. However, the increase that we observe provides no evidence of substitution between expenditures and home production. When applying our results to the lifecycle model, we find a confirmation of the low substitution between expenditures and home production. In addition, we find that Dutch households have a clear preference for smoothing leisure over time. This is important information for the study of intertemporal decisions such as saving, labor supply, and retirement.[20]

The draft legislation on Future Pensions states that pension providers must determine risk aversion and risk capacity every five years. Basic models often assume a certain future income. For young people, this means that their pension assets can be invested in a relatively high-risk way. In practice, however, people can become

20 For an application of our results in the context of the lifecycle model, see Appendix B.

unemployed, and this flattens the optimal risk profile.[21] In summary, our results indicate that unemployment does not substantially compromise the economic situation of Dutch households in terms of their level of consumption. However, part of the consumption smoothing is likely to come from the use of private savings to finance spending. In addition, even if the results indicate home pro duction as an additional resource to mitigate the effects of potentially negative income shocks (especially among older workers), our analysis provides no clear evidence of substitution between expenditures and home production. Therefore, possibly negative income shocks due to unemployment should be taken into account, as these flatten the optimal age profile of the high-risk portfolio share in pension assets. These results are relevant input for pension funds as they strive to make accurate assessments of the risks caused by unemployment and other events that can have negative effects on income and assets accumulation.

21 As mentioned by Joseph et al. (2021), models can take into account uncertain future income and a positive correlation between unemployment and high-risk investments.

References

Aguiar, M. & Hurst, E. (2005). Consumption versus expenditure. *Journal of Political Economy*, *113*(5), 919–948.

Aguiar, M. & Hurst, E. (2007). Life-cycle prices and production. *American Economic Review*, *97*(5), 1533–1559.

Aguiar, M., Hurst, E., & Karabarbounis, L. (2013). Time use during the Great Recession. *American Economic Review*, *103*(5), 1664–1696.

Ahn, N., Jimeno, J., & Ugidos, A. (2008). "Mondays at the sun": Unemployment, time-use, and consumption patterns in Spain. *Contributions to Economic Analyses*, *271*, 237–259.

Ameriks, J., Briggs, J., Caplin, A., Lee, M., Shapiro, M., & Tonetti, C. (2020). Older Americans would work longer if jobs were flexible. *American Economic Journal: Macroeconomics*, *12*(1), 174–209.

Arulampalam, W. (2001). Is unemployment really scarring? Effects of unemployment experiences on wages. *The Economic Journal*, *111*(475), 585–606.

Bagliano, F., Fugazza, C., & Nicodano, G. (2019). Life-cycle portfolios, unemployment and human capital loss. *Journal of Macroeconomics*, *60*, 325–340.

Basten, C., Fagereng, A., & Telle, K. (2016). Saving and portfolio allocation before and after job loss. *Journal of Money, Credit, and Banking*, *48*(2-3), 293–324.

Becker, G. (1965). A theory of the allocation of time. *The Economic Journal*, *75*, 493–517.

Been, J., Rohwedder, S., & Hurd, M. (2020). Does home production replace consumption spending? Evidence from shocks in housing wealth in the great recession. *Review of Economics and Statistics*, *102*(1), 113–128.

Best, M., Cloyne, J., Ilzetzki, E., & Kleven, H. (2020). Estimating the elasticity of intertemporal substitution using mortgages notches. *Review of Economic Studies*, *87*(2), 656–690.

Bremus, F. & Kuzin, V. (2014). Unemployment and portfolio choice: Does persistence matter? *Journal of Macroeconomics*, *40*, 99–113.

Browning, M. & Crossley, T. (2001). Unemployment insurance levels and consumption changes. *Journal of Public Economics*, *80*, 1–23.

Browning, M. & Crossley, T. (2008). The long-run cost of job loss as measured by consumption changes. *Journal of Econometrics*, *145*(1-2), 109–120.

Browning, M. & Crossley, T. (2009). Shocks, stocks, and socks: Smoothing consumption over a temporary income loss. *Journal of the European Economic Association*, *7*(6), 1169-1192.

Burda, M. & Hamermesh, D. (2010). Unemployment, market work and household production. *Economics Letters*, *107*, 131–133.

Burdett, K., Carillo-Tudela, C., & Coles, M. (2020). The cost of job loss. *Review of Economic Studies*, *Forthcoming*.

Cammeraat, E., Jongen, E., & Koning, P. (2019). The added worker effect in the Netherlands before and during the Great Recession (Mimeo).

Carroll, C., Dynan, K., & Krane, S. (2003). Unemployment risk and precautionary wealth: Evidence from households' balance sheets. *Review of Economics and Statistics*, *85*(3), 586–604.

Cashin, D. & Unayama, T. (2016). Measuring intertemporal substitution in consumption: Evidence from a VAT increase in Japan. *Review of Economics and Statistics*, *98*(2), 285–297.

Chetty, R. (2012). Bounds on elasticities with optimization frictions: A synthesis of micro and macro evidence on labor supply. *Econometrica*, *80*(3), 969–1018.

Chetty, R. & Szeidl, A. (2007). Consumption commitments and risk preferences. *Quarterly Journal of Economics*, *122*(2), 831-877.

Chetty, R. & Szeidl, A. (2016). Consumption commitments and habit formation. *Econometrica*, *84*(2), 855–890.

Cocco, J. (2005). Portfolio choice in the presence of housing. *Review of Financial Studies*, *18*, 535–567.

De Nardi, M., Fella, G., Knoef, M., Paz-Pardo, G., & Van Ooijen, R. (2021). Family and government insurance: Wage, earnings, and income risks in the Netherlands and the US. *Journal of Public Economics*, *193*, No. 104327.

Dynarski, M. & Sheffrin, S. (1987). Consumption and unemployment. *Quarterly Journal of Economics*, *102*(2), 411–428.

Gallen, Y. (2013). Anticipating unemployment: Savings evidence from Denmark (Mimeo).

Gelber, A. & Mitchell, J. (2012). Taxes and time allocation: Evidence from single women and men. *Review of Economic Studies*, *79*, 863–897.

Gerard, F. & Naritomi, J. (2019). Job displacement insurance and (the lack of) consumption-smoothing. NBER working paper, no. 25749.

Gomes, F. & Ribeiro, P. (2015). Estimating the elasticity of intertemporal substitution taking into account the precautionary savings motive. *Journal of Macroeconomics*, *45*, 108–123.

Griffith, R., O'Connell, M., & Smith, K. (2016). Shopping around: How households adjusted food spending over the Great Recession. *Economica*, *83*(330), 247–280.

Gruber, J. (1997). The consumption smoothing benefits of unemployment insurance. *American Economic Review*, *87*(1), 192–205.

Gruber, J. (1998). Unemployment insurance, consumption smoothing, and private insurance: Evidence from the PSID and CEX. *Research in Employment Policy*, *1*(1), 3.

Hardoy, I. (2014). Displacement and household adaptation: Insured by the spouse or the state? *Journal of Population Economics*, *27*(3), 683–703.

Hayashi, F., Altonji, J., & Kotlikoff, L. (1996). Risk-sharing between and within families. *Econometrica*, *64*(2), 261–294.

Hendren, N. (2017). Knowledge of future job loss and implications for unemployment insurance. *American Economic Review*, *107*(7), 1778–1823.

Joseph, A., Pelsser, A., & Werner, L. (2021). *Beleggingsbeleid bij onzekerheid over risicobereidheid en budget*. (Netspar Discussion Paper, No. 2021-174)

Knoef, M., Been, J., Alessie, R., Caminada, K., Goudswaard, K., & Kalwij, A. (2016). Measuring retire- ment savings adequacy: A multi-pillar approach in the Netherlands. *Journal of Pension Economics and Finance*, *15*(1), 1–35.

Kroft, K. & Notowidigdo, M. (2016). Should unemployment insurance vary with the unemployment rate? Theory and evidence. *Review of Economic Studies*, *83*, 1092–1124.

Krueger, A. & Mueller, A. (2012). Time use, emotional well-being, and unemployment: Evidence from longitudinal data. *American Economic Review: Papers & Proceedings*, *102*(3), 594–599.

Lise, J. & Yamada, K. (2019). Household sharing and commitment: Evidence from panel data in individual expenditures and time use. *Review of Economic Studies*, *86*(5), 2184–2219.

Michelacci, C. & Ruffo, H. (2015). Optimal life cycle unemployment insurance. *American Economic Review*, *105*(2), 816-859.

OECD. (2019a). OECD tax-benefit data portal (https://www.oecd.org/els/soc/benefits-and-wages/data/).

OECD. (2019b). OECD labour force statistics (https://www.oecd.org/employment/).

Pistaferri, L. (2003). Anticipated and unanticipated wage changes, wage risk, and intertemporal labor supply. *Journal of Labor Economics*, *21*(3), 729–754.

Rogerson, R. & Wallenius, J. (2016). Retirement, home production and labor supply elasticities. *Journal of Monetary Economics*, *78*, 23–34.

Rupert, P., Rogerson, R., & Wright, R. (1995). Estimating substitution elasticities in household production models. *Economic Theory*, *6*, 179–193.

Stephens, M. (2002). Worker displacement and the added worker effect. *Journal of Labor Economics*, *20*(3), 504-537.

Stephens, M. (2004). Job loss expectations, realizations, and household consumption behavior. *Review of Economics and Statistics*, *86*(1), 253–269.

Stevens, A. (1997). Persistent effects of job displacement: The importance of multiple job losses. *Journal of Labor Economics*, *15*(1), 165-188.

Appendices

A. Additional Tables

Table A.1: Summary Statistics – Control Variables

	Employed	Unemployed	Total
Female	25.80%	35.29%	26.18%
Partner	69.85%	46.22%	68.92%
Number of children	1.00	0.56	0.98
Age			
25–34	15.94%	11.55%	15.76%
35–44	26.26%	18.07%	25.94%
45–54	31.81%	23.11%	31.47%
55–64	25.99%	47.27%	26.83%
Education			
Primary	1.63%	2.31%	1.66%
Secondary	24.24%	32.35%	24.56%
Vocational education	56.93%	51.68%	56.73%
University	14.38%	8.40%	14.15%
No education	0.41%	0.63%	0.42%
Other	2.40%	4.62%	2.49%

Notes: All summary statistics are computed using the same sample as in Table 1, containing 12,141 observations. The statistics obtained when using the samples in Tables 2 to 4 are very similar. For the number of children, the average is provided.

Table A.2: Summary Statistics – Expenditures (household level)

	Employed	Unemployed	Total
Total	2,140.21	1,685.64	2,122.39
	(1,310.51)	(1,102.74)	(1,305.93)
	95.24%	93.91%	95.19%
Mortgage	464.01	246.84	455.50
	(494.81)	(412.48)	(493.63)
	59.09%	35.92%	58.18%
Rent	106.49	221.52	111.00
	(222.85)	(261.96)	(225.61)
	20.58%	44.75%	21.53%
Utilities	181.05	181.94	181.08
	(125.30)	(111.63)	(124.79)
	81.00%	87.18%	81.25%
Transport	133.52	97.49	132.11
	(131.4868)	(101.18)	(130.61)
	78.74%	78.57%	78.73%
Insurance	198.88	171.35	197.80
	(172.32)	(141.14)	(171.29)
	78.65%	84.45%	78.87%
Alimony	17.67	11.41	17.43
	(79.06)	(53.71)	(78.23)
	6.99%	6.09%	6.95%
Debt	30.27	39.08	30.62
	(88.36)	(106.28)	(89.15)
	16.06%	19.54%	16.19%
Cleaning	37.71	25.70	37.24
	(56.60)	(42.93)	(56.17)
	61.87%	58.19%	61.72%
Food at home	322.58	258.18	320.05
	(230.61)	(203.62)	(229.94)
	87.02%	88.24%	87.07%
Daycare	27.08	6.34	26.27
	(115.21)	(59.17)	(113.61)
	8.68%	2.73%	8.45%
Holidays	114.51	63.77	112.52
	(181.63)	(154.95)	(180.92)
	52.22%	34.03%	51.50%
Other	94.43	67.79	93.39
	(138.49)	(101.56)	(137.32)
	57.58%	58.19%	57.61%

Notes: All summary statistics are computed using the same sample as in Table 1, containing 12,141 observations. For each category, the first line provides the average, the second the standard deviation, and the third the percentage of non-zero observations.

Table A.3: Summary Statistics – Individual Level Expenditures

	Employed	Unemployed	Total
Eating out	63.77	57.22	63.57
	(82.35)	(87.23)	(82.51)
	81.66%	68.09%	81.24%
Tobacco	20.90	23.99	21.00
	(46.68)	(43.78)	(46.59)
	27.18%	34.04%	27.39%
Clothing	106.56	86.19	105.92
	(114.12)	(105.98)	(113.92)
	90.68%	79.26%	90.32%
Personal care	42.56	41.53	42.53
	(43.81)	(48.22)	(43.95)
	90.69%	84.57%	90.50%
Medical care	24.18	27.35	24.28
	(42.16)	(44.69)	(42.24)
	60.21%	59.04%	60.18%
Leisure	60.29	49.69	59.96
	(71.75)	(62.35)	(71.49)
	84.90%	74.47%	84.57%
Schooling	11.31	9.98	11.27
	(39.43)	(40.18)	(39.45)
	15.71%	11.70%	15.58%
Donations	48.52	39.14	48.23
	(54.55)	(55.33)	(54.60)
	88.19%	75.53%	87.79%
Other	15.52	13.22	15.45
	(33.28)	(26.62)	(33.09)
	35.60%	36.17%	35.62%

Notes: All summary statistics are computed using the same sample as in Table 2, containing 5,969 observations. For each category, the first line provides the average, the second the standard deviation, and the third the percentage of non-zero observations.

Table A.4: Summary Statistics – Time Use

	Employed	Unemployed	Total
Paid work	35.36	7.67	34.13
	(13.74)	(14.94)	(14.93)
	93.79%	27.11%	90.83%
Commuting	4.57	1.46	4.43
	(4.01)	(3.37)	(4.03)
	89.92%	28.90%	87.21%
Household chores	10.08	16.56	10.33
	(8.23)	(11.63)	(8.47)
	97.32%	96.62%	97.29%
Activities with children	4.57	3.66	4.53
	(8.83)	(9.79)	(8.87)
	35.15%	20.72%	34.51%
Informal care	3.08	5.62	3.19
	(5.57)	(8.79)	(5.77)
	49.62%	58.57%	50.02%
Leisure activities	31.81	40.54	32.14
	(18.20)	(22.26)	(18.44)
	99.25%	98.55%	99.22%
Schooling	1.52	1.92	1.54
	(4.13)	(5.87)	(4.21)
	24.01%	22.71%	23.96%
Sleeping and resting	57.94	59.96	58.01
	(13.14)	(15.93)	(13.26)
	99.79%	99.52%	99.78%
Personal care	8.22	10.85	8.32
	(5.42)	(7.08)	(5.51)
	99.71%	99.38%	99.70%
Administrative chores	2.78	4.16	2.83
	(2.90)	(4.38)	(2.98)
	87.34%	89.44%	87.41%

Notes: All summary statistics are computed using the same samples as in Table 3. The sample for paid work, commuting, activities with children, and informal care includes 8,807 observations. The sample for household chores, leisure activities, schooling, and sleeping and resting includes 5,538 observations. The sample for personal care and administrative chores includes 4,330 observations. For each category, the first line provides the average, the second the standard deviation, and the third the percentage of non-zero observations.

Table A.5: Summary Statistics – Time Use (Additional Categories)

	Employed	Unemployed	Total
Small house jobs	2.94	3.66	2.97
	(3.94)	(5.20)	(4.00)
	73.11%	68.70%	72.94%
Caring for plants/ animals	1.77	2.44	1.80
	(3.65)	(4.56)	(3.69)
	51.26%	57.50%	51.51%
Cooking	2.63	3.88	2.68
	(3.13)	(4.03)	(3.17)
	66.83%	74.63%	67.13%
Shopping	1.07	1.38	1.08
	(1.74)	(1.96)	(1.75)
	43.79%	50.08%	44.03%
Sports	1.94	1.87	1.94
	(2.32)	(2.41)	(2.33)
	57.57%	50.25%	57.28%
Watching TV	17.28	23.58	17.53
	(10.15)	(13.80)	(10.39)
	98.20%	97.36%	98.17%
Listening to radio	18.00	18.87	18.03
	(19.00)	(20.81)	(19.08)
	86.35%	78.58%	86.05%
Reading	2.71	3.84	2.75
	(4.12)	(5.89)	(4.21)
	60.79%	61.61%	60.83%
Listening to music	9.58	11.45	9.65
	(14.50)	(15.28)	(14.54)
	72.18%	73.31%	72.22%
Going out	1.19	1.16	1.19
	(2.11)	(2.23)	(2.11)
	36.34%	32.78%	36.20%
Volunteering	1.06	1.93	1.10
	(2.72)	(4.44)	(2.81)
	26.96%	29.49%	27.06%
Other activities	1.85	2.36	1.87
	(2.96)	(3.40)	(2.98)
	51.92%	54.86%	52.03%

Notes: All summary statistics are computed using the same samples as in Table 3. The sample for paid work, commuting, activities with children, and informal care includes 8,807 observations. The sample for household chores, leisure activities, schooling, and sleeping and resting includes 5,538 observations. The sample for personal care and administrative chores includes 4,330 observations. For each category, the first line provides the average, the second the standard deviation, and the third the percentage of non-zero observations.

Table A.6: Results – Total Consumption (Extended)

Dep. Variable	(1) OLS-1	(2) OLS-2	(3) FE
Unemployment	-454.57***	-207.76***	-110.21*
	(58.96)	(53.61)	(63.81)
Female		-43.18	
		(36.03)	
Partner		563.22***	323.67***
		(34.94)	(83.31)
Number of children		51.50***	198.28***
		(17.58)	(36.48)
Age (35-44)		108.28***	98.68
		(41.05)	(69.06)
Age (45-54)		-28.52	81.87
		(43.97)	(94.24)
Age (55-64)		-61.39	29.04
		(42.34)	(118.35)
Secondary education		139.72	310.82
		(96.58)	(269.37)
Vocational education		354.93***	265.91
		(94.37)	(273.24)
University education		837.50***	196.25
		(105.05)	(343.64)
No education		253.51	638.70**
		(287.01)	(280.90)
Other		138.26	391.54
		(125.51)	(291.49)
2010		-31.42	-62.38*
		(32.76)	(32.56)
2012		38.04	-95.45**
		(35.86)	(37.08)
2015		-106.22***	-255.91***
		(35.52)	(42.73)
2017		-161.43***	-345.40***
		(37.62)	(49.56)
2019		169.99***	-10.69
		(43.93)	(58.17)
Constant	2,140.21***	1,364.35***	1,700.56***
	(17.84)	(101.62)	(274.03)
Observations	12,141	12,141	12,141
R-squared	0.005	0.094	0.036

Notes: *significant at the 10% level, **significant at the 5% level, ***significant at the 1% level.

Table A.7: Results – Total Consumption (Expectations)

	(1)	(2)	(3)	(4)
Job loss	-262.55**			
	(108.28)			
Job loss – shock		-380.86**		-288.97*
		(174.76)		(169.37)
Job loss – expected			-312.551**	-244.038
			(157.25)	(156.00)
Age (35-44)	-94.24	-96.17	-94.11	-94.36
	(61.31)	(61.36)	(61.28)	(61.33)
Age (45-54)	-136.37**	-138.43**	-136.02**	-136.51**
	(58.48)	(58.49)	(58.46)	(58.50)
Age (55-64)	-162.52***	-165.70***	-163.10***	-162.66***
	(59.06)	(59.09)	(59.03)	(59.07)
Single to married	292.12**	289.43**	293.97**	291.83**
	(133.76)	(134.02)	(133.74)	(133.83)
Married to single	-396.78**	-403.50**	-395.50**	-397.26**
	(164.94)	(165.36)	(165.17)	(165.10)
ΔNumber of children	100.76**	101.87**	101.50**	100.77**
	(50.00)	(50.00)	(50.05)	(50.01)
2012	-24.63	-25.31	-22.84	-24.80
	(58.41)	(58.44)	(58.44)	(58.46)
2015	-125.08**	-124.79**	-123.25**	-125.20**
	(52.23)	(52.26)	(52.21)	(52.26)
2017	-48.31	-47.53	-46.44	-48.40
	(50.56)	(50.59)	(50.56)	(50.59)
2019	443.47***	444.87***	445.52***)	443.39***
	(63.69)	(63.68)	(63.69	(63.69)
Constant	61.85	61.93	58.95	62.07
	(61.30)	(61.35)	(61.25)	(61.34)
Observations	5,591	6,591	6,591	6,591
R-squared	0.031	0.031	0.031	0.031

Notes: All regressions are estimated using first differences in total consumption as a dependent variable. *significant at the 10% level, **significant at the 5% level, ***significant at the 1% level.

B. Implications for the Lifecycle Model

To put our empirical results on expenditures and home production in a theoretical perspective, we present a simplified version of the lifecycle model based on Rogerson & Wallenius (2016). This model allows us to study how unemployment affects the decisions by individuals regarding expenditures, leisure, and home produc tion. In addition, it leads to an expression for the ratio between the intertemporal elasticity of substitution of leisure and the elasticity of substitution between spending and home production. Based on our results in Section 5, we provide several numerical computations of this ratio. In this way, we show the broader implications of our results, since these elasticity parameters are highly important for studying a variety of lifecycle decisions, including saving, labor supply, and retirement.

B.1 Unemployment in a Lifecycle Model with Home Production

Consider the utility function

$$U = \sum_{t=0}^{T} (1+\delta)^{-t} \left[u(c_t) + \theta \frac{l_t^{1-\frac{1}{\gamma}}}{1-\frac{1}{\gamma}} \right], \tag{B.1}$$

where c_t is consumption in period $t = 0, \ldots, T$, l_t is hours of leisure, $\delta \geq 0$ is the rate of time preference, $\gamma \geq 0$ is the elasticity of intertemporal substitution for leisure, and $0 \leq \theta \leq 1$ determines the weight that the individual gives to leisure. We assume the intratemporal utility function for consumption $u(c_t)$ to be strictly increasing, strictly concave, and twice continuously differentiable. In addition, we assume that c_t is a CES aggregate of consumption expenditures, c_{mt}, and time spent on home production, h_{nt}, such that

$$c_t = \left[a c_{mt}^{\frac{\eta-1}{\eta}} + (1-a) h_{nt}^{\frac{\eta-1}{\eta}} \right]^{\frac{\eta}{\eta-1}}, \tag{B.2}$$

where η is the intratemporal elasticity of substitution between c_{mt} and h_{nt}, while a determines the relative weights given to c_{mt} and h_{nt}.

Consider in addition the intertemporal monetary budget constraint

$$\sum_{t=0}^{T} \frac{c_{mt}}{(1+\delta)^t} = \sum_{t=0}^{T} \frac{w_t h_{mt}}{(1+\delta)^t}, \tag{B.3}$$

where w_t and h_{mt} denote the hourly wage and hours of market work, respectively, and the period-specific time budget constraint

$$l_t = T - h_{mt} - h_{nt}, \tag{B.4}$$

where T is the total time endowment for period t. For the sake of simplicity and without loss of generality, we assume the number of hours of market work to be fixed, i.e. $h_{mt} = \bar{h}$, and consider only interior solutions for l_t and h_{nt}.

The individual chooses c_{mt} and h_{nt} such as to maximize (B.1) subject to (B.3) and (B.4). Normalizing the total time endowment to unity and substituting the time budget constraint in the utility function yields the first order conditions

$$u'(c_t)c_t^{\frac{1}{\eta}}c_{mt}^{-\frac{1}{\eta}}a = \lambda \tag{B.5}$$

and

$$u'(c_t)c_t^{\frac{1}{\eta}}h_{nt}^{-\frac{1}{\eta}}(1-a) = \theta(1-\bar{h}-h_{nt})^{-\frac{1}{\gamma}}, \tag{B.6}$$

where λ is the Lagrangian multiplier. Equations B.5 and B.6, together with the constraints B.3 and B.4, jointly determine the optimal choice of c_{mt}, h_{nt}, and l_t given $h_{mt} = \bar{h}$.

Assume now that at period $t = \tau$ the individual suffers an involuntary job loss, meaning h_{mt} is no longer equal to $\bar{h}$ but is now exogenously set equal to zero. This implies a relaxation of the time budget constraint since the individual now has an additional amount of time equal to $\bar{h}$ to be divided between extra leisure and/or home production. In addition, the individual experiences an income reduction since labor income, $w_t h_{mt}$, is substituted by the lower UI benefit b_t.[22]

Implementing $\bar{h} = 0$, the first order conditions at period τ become

$$u'(c_\tau)c_\tau^{\frac{1}{\eta}}c_{m\tau}^{-\frac{1}{\eta}}a = \lambda \tag{B.7}$$

and

$$u'(c_\tau)c_\tau^{\frac{1}{\eta}}h_{n\tau}^{-\frac{1}{\eta}}(1-a) = \theta(1-h_{n\tau})^{-\frac{1}{\gamma}}. \tag{B.8}$$

Assuming $\delta = r$ and dividing B.7 and B.8 by the same first order conditions at period $t = \tau - 1$, which are given by Equations B.5 and B.6 respectively, yields

22 Besides the changes in the monetary and time budget constraints, the optimal choice of c_{mt} and h_{nt} during unemployment could also be affected by complementarities between consumption and leisure. Such complementarities would imply a multiplicative specification in the utility function. For the sake of simplicity, we abstract from this possibility in the theoretical model.

$$\left[\frac{c_{m\tau-1}}{c_{m\tau}}\right]^{\frac{1}{\eta}} = \frac{u'(c_{\tau-1})}{u'(c_{\tau})}\left[\frac{c_{\tau-1}}{c_{\tau}}\right]^{\frac{1}{\eta}} \tag{B.9}$$

and

$$\left[\frac{1-h_{n\tau}}{1-\bar{h}-h_{n\tau-1}}\right]^{\frac{1}{\gamma}}\left[\frac{h_{n\tau-1}}{h_{n\tau}}\right]^{\frac{1}{\eta}} = \frac{u'(c_{\tau-1})}{u'(c_{\tau})}\left[\frac{c_{\tau-1}}{c_{\tau}}\right]^{\frac{1}{\eta}}. \tag{B.10}$$

Dividing (B.9) by (B.10), taking the natural log on both sides of the equality and rearranging allows expressing the ratio between γ and η as

$$\frac{\gamma}{\eta} = \frac{\ln(1-h_{n\tau}) - \ln(1-\bar{h}-h_{n\tau-1})}{\ln(c_{m\tau-1}/c_{m\tau}) - \ln(h_{n\tau-1}/h_{n\tau})}. \tag{B.11}$$

B.2 Computation of Elasticities

Equation B.11 provides an expression for calculating the ratio between the intertemporal elasticity of substitution for leisure, γ, and the intratemporal elasticity of substitution between expenditures and home production, η. More specifically, Equation B.11 shows that the ratio between γ and η equals the relative change in leisure time, divided by the difference between the relative change in consumption expenditures and the relative change in time spent on home production. Both γ and η are very important parameters that are usually employed in lifecycle models. They respectively determine the curvature of the utility function and the extent to which expenditures can be substituted by home production. Therefore, any knowledge about the value they take, based on empirical estimations, is crucial for calibrations of the lifecycle model. The empirical analysis we conduct allows computing a value for this ratio, which we compare with the values usually given in the literature.

The literature on the estimation of γ typically finds estimates ranging between 0.4 and 0.8, while the literature on estimating η usually reports values ranging between 1.7 and 2.5.[23] The values of γ indicate a large degree of concavity in the utility function, which indicates that individuals have a preference for smoothing leisure over time, while the values for η mean that expenditures and home production can be substituted fairly easily by each other. Rogerson & Wallenius (2016) propose γ = 0.4 and η = 2 as the consensus estimates in the literature, which results in γ/η = 1/5.

23 For the literature on estimating γ, see for instance Pistaferri (2003), Chetty (2012), Gomes & Ribeiro (2015), Cashin & Unayama (2016), Ameriks et al. (2020), and Best et al. (2020). For the literature on estimating η, see for instance Rupert et al. (1995), Aguiar & Hurst (2005 and 2007), and Gelber & Mitchell (2012). For a review of both strands of literature, see Rogerson & Wallenius (2016).

Following Equation B.11, we substitute total expenditures and household chores in our point estimates for the changes in leisure to obtain[24]

$$\frac{\gamma}{\eta} = \frac{\ln(1.326)}{\ln(1.055) - \ln(0.660)} = 0.601, \tag{B.12}$$

which is much closer to 2/3 than to 1/5. Considering transitions to retirement instead of to unemployment, Rogerson & Wallenius (2016) obtain a ratio that is very close to one, implying that γ and η are of a similar magnitude. Such a result is difficult to reconcile with the existing literature, since it means that either γ is much larger than usually estimated, or that η is much lower. The ratio we estimate is easier to reconcile with the literature since it implies that η is substantially larger than γ. In fact, if we take values of γ near the upper end estimates in the literature and values of η near the lower end estimates, the ratio gets very close to 1/2, which is much closer to 2/3 than to one.

An important limitation of the calculation by Rogerson & Wallenius (2016) is that they do not have data on consumption; hence they rely on the general evidence in the literature, which is mostly based on food expenditures, to calculate the change in total expenditures upon retirement. The richness of the data we employ allows us to study the sensitivity of the relationship between γ and η to using different categories of expenditure and time use. This is very relevant since, as argued by Been et al. (2020), there are only a few expenditure categories that can be substituted by home production. If we re- calculate γ/η only using expenditure categories that could be substituted by home production, i.e. house and garden cleaning, eating out, and child care, and add activities with children to the household chores time use category, we obtain

$$\frac{\gamma}{\eta} = \frac{\ln(1.326)}{\ln(1.018) - \ln(0.716)} = 0.801. \tag{B.13}$$

For a fixed value of γ, this result implies an even lower value of η compared to the calculation in Equation B.12. Assuming unity as a lower bound for η, the calculation in Equation B.13 restricts the possible values of γ to the upper end estimates in the

24 The estimates in column 3 of Table 3 show that leisure time increases by 10,501 hours when individuals become unemployed. Given that the average in the sample is 32,143 hours, we set $(1-\bar{h}-h_{n\tau-1}) = 32.143$ and $(1-h_{n\tau}) = 32.143 + 10.501 = 42.644$, which yields $(1-h_{n\tau})/(1-\bar{h}-h_{n\tau-1}) = 1.258$. We conduct the same operation with household chores and total expenditures to obtain the numbers in Equation B.12

literature, namely 0.8.[25] This result would imply a η of one or just above one, indicating very low substitution between expenditures and home production. In addition, this result indicates that Dutch households have a strong preference to smooth leisure over time. These are important parameter values to take into account when studying lifecycle decisions such as saving, labor supply, and retirement.

25 Values of η below one would imply that expenditures and home production are actually complements rather than substitutes. In line with the calculation in Equation B.13, values for γ below 0.801 result in values for η below one.

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