Work in Progress

Consumption and Time Use Responses to Unemployment *

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Abstract

This paper analyzes consumption and time use responses to unemployment within the context of the life cycle model. Using micro panel data one a wide range of expenditure and time use categories we estimate relatively small drops in expenditure after a job loss, while we estimate large increases in time spent on home production and leisure activities. Despite the increase in leisure time, we find no evidence for increased expenditure on leisure activities. In addition, we find no evidence of substitution between expenditure and home production. Applied to the theoretical framework by Rogerson & Wallenius (2016), our results suggest an intertemporal substitution for leisure near the upper end of the estimates provided by the literature, and and elasticity of substitution between expenditure and home production that is just above one.

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1 Introduction

Job loss is often a disruptive life event. It can occur anytime during the life-course, it can happen multiple times throughout the life-course, and often has a detrimental effect on income (Stevens, 1997; Burdett et al., 2020). In addition, it can have permanent effects through potential scarring that may reduce future wages substantially (Arulampalam, 2001). To the extent that job loss is unexpected and has permanent effects, it will require households to adapt their consumption plans for the future. However, households can insure themselves against consumption drops by means of formal risk sharing between households, i.e. unemployment insurance (UI) benefits, and/or informal risk sharing within households, i.e. spousal labor supply and private savings (Hayashi et al., 1996).[1]

In addition to decrease in income, unemployment implies an increase in free time, which has important implications for how households adjust consumption. According to the theory on the allocation of time by Becker (1965), decreases in consumption expenditure can be mitigated by increasing time dedicated to home production. As an example, Stephens (2004) shows substantial drops in food expenditure due to job loss, however 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 decrease in working time due to unemployment increases home production by 20 minutes. Although these results suggest that expenditures and home production are substitutes, Been et al. (2019) point that several expenditure categories are clearly not substitutable, which makes one-to-one substitution between total expenditure and home production unlikely to hold.

Besides providing additional time for home production, unemployment may affect consumption in case the latter is complementarity between with leisure and/or working time (Laitner & Silverman, 2005; Aguiar & Hurst, 2013). For instance, work related expenditures such as commuting are automatically reduced upon job loss, while households may redirect resources towards leisure-related expenditure because of the increase in available free time. Krueger & Mueller (2012) find substantial increases in time spent on leisure activities during unemployment. However, Aguiar et al. (2013) show that this

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

additional leisure time consists of watching TV and sleeping. Therefore, it is not entirely clear to what extent increased leisure time due to unemployment actually translates into an increase in leisure related expenditures.

Substitutability between expenditure and home production and complementarity between consumption and leisure imply that, even if it is not unexpected and does not have permanent effects, job loss may still have an effect on expenditures. Therefore, a full understanding of how job loss affects consumption and well-being should take these aspects into account. In the present paper we do so by employing data from the Longitudinal Internet Studies for the Social Sciences (LISS). The LISS is a panel survey representative of the Dutch population, which provides information on labor market status of individuals, as well as on a wide range of expenditure and time use categories, over the period 2009-2019. We exploit the richness of the data to estimate the effects of unemployment on expenditures and time use while controlling for individual (un)observed heterogeneity. The analysis allows us to draw conclusions on the different mechanisms explaining how consumption changes due to unemployment.

We contribute to the existing literature in a number of ways. First, this is the first study to investigate the effects of unemployment by exploiting longitudinal micro data on comprehensive categories of both expenditure and time use. Previous studies using expenditure data either focus on food expenditure only (Stephens, 2004; Aguiar & Hurst, 2005) or on a wider but still limited range of categories (Gruber, 1998; Gerard & Naritomi, 2019). Other studies use detailed information on time use but lack the information on expenditures (Krueger & Mueller, 2012; Aguiar et al., 2013; Griffith et al., 2016). Ahn et al. (2008) and Burda & Hamermesh (2010) use both expenditure and time use information. However, the data are cross-sectional thus they can only draw correlations based on comparisons between employed and unemployed individuals.

Second, we explore the implications of using richer data for the calculation of very relevant elasticity parameters usually employed in life cycle models. For that purpose, we employ the theoretical framework by Rogerson & Wallenius (2016), in which individuals choose consumption expenditure, leisure, and home production to maximize utility. Different from the model in Been et al. (2019), which allows studying the effects of income shocks while keeping the time budget fixed, the model by Rogerson

& Wallenius (2016) allows studying how individuals respond when both income and the time budget change, which is the case with job loss. The model yields an expression for the ratio of the intertemporal elasticity of substitution for leisure over the elasticity of substitution between expenditure and home production. We use our empirical results to compute this ratio and compare it with the values for these parameters usually employed in the literature.

Last but not least, whereas most related literature is based on American[2] or Canadian data,[3] this is the first paper to present evidence for the Netherlands. Characteristics of the labor market as well as the design of UI benefits are important factors in determining how individuals respond to job loss. Therefore, it is important to study the effects on consumption and time use in different settings and examine the extent to which results can be generalized across countries. Compared to the USA and Canada, the Dutch labor market is less flexible, unemployment is more persistent, and the UI benefit system is considerably more generous. These are important differences that make the Netherlands a relevant case to consider.

The results we obtain show a drop of 5% in household expenditure due to job loss. The effect increases to about 15% when using subjective job loss expectations to isolate the unexpected component of the job loss event. This decrease is mostly due to reductions in the expenditure categories of transport, debts and loans, insurances, medical care, and donations. However, these declines are rather mild compared to what the literature typically estimates, and in most cases the estimates are not strongly significant in statistical sense. The lack of a clearer response of expenditures to job loss may partially be due to the fact that the Netherlands has a generous UI benefit system that guarantees a minimum replacement rate of 70%.

Most remarkably, we do not find significant declines in expenditure categories that could be replaced by home production, i.e. house cleaning and gardening, food outside the home, and childcare; and we do not find an increase in leisure related expenditures. This contrasts with the fact that we do estimate strong and statistically significant increases in time spent on household chores and on leisure activities. An analysis of several subcategories reveals that the increase in time spent on household chores is mostly

[2]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).

[3]For instance, see Browning & Crossley (2001, 2008, 2009).

due to house repairs, gardening, and cooking; while the increase in time spent on leisure activities mostly consists of TV time.

These results suggest that there is no complementarity between expenditures and leisure time during unemployment. This is in line with the findings by Krueger & Mueller (2012), who argue that leisure time is less enjoyable during unemployment due to a decline in emotional well-being. In addition, the results indicate that the estimated increase in time spent on household chores is not due to substitution of expenditures for home production. Rather, they suggest that there may be a leisure component to certain home production activities, as already pointed out by Pollak & Watcher (1975) and Kerkhofs & Kooreman (2003). Combining the estimates we obtain with our version of the model by Rogerson & Wallenius (2016), we find a result confirming that the elasticity of substitution between expenditure and home production is rather low, i.e. just above one, when assuming values for the intertemporal elasticity of substitution for leisure near the upper end estimates in the literature, i.e. around 0.7. This would imply that individuals do have preference for smoothing leisure over time expenditure and that there is very low substitutablity between expenditures and home home production.

The remainder of the paper is structured as follows. Section 2 explains how UI benefits work in the Netherlands. Section 3 provides our version of the theoretical model by Rogerson & Wallenius (2016). Section 4 explains our empirical strategy. Section 5 presents the data. Section 6 presents our estimation results. Section 7 discusses the theoretical implications of our estimation results. Section 8 rounds up the paper with a conclusion.

2 Institutional background

As described by the OECD (2019b), the Netherlands has a considerably generous unemployment insurance (UI) benefit system. The system is indeed built to keep the purchasing power of employees unchanged to a large extent. However, it is also equipped with a series 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 relevant to understand the consumption behavior of unemployed individuals.

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 culpable for the job loss. The duration of UI benefits depends on work history. The minimum duration is three months, and it is 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 been made less generous: one month for every 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 weekly monitored by the unemployment service.

The first two months, the UI benefits replace 75% of the last earnings with an absolute maximum of 3,100 euros.[4] After that, the replacement rate is reduced to 70% of the last earnings and the maximum is 2,900 euros. Prior to 2016, replacement rates were 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.[5] When UI benefits are exhausted, individuals can claim asset- and income-based means-tested welfare benefits that guarantee a minimum standard of living. In addition, older individuals can apply for additional benefits that are only income dependent.

From an international perspective, UI benefits are relatively generous in the Netherlands. According to the OECD (2019a), the net replacement rate for the first two months of job loss is one of the highest among OECD countries and is about 30, 40, and 15 percentage points higher than in the USA., the UK, and Germany respectively. Between the 2nd and the 24th month is still relatively generous (it is about 65, 35, and 35 percentage points higher than in the USA, the UK, and Germany respectively). However, after 24 months, the generosity of UI benefits in the Netherlands drops very substantially compared to other countries. Therefore, despite a relatively generous replacement rate, job loss can have severe consequences for current and future income of households in the Netherlands, specially taking into account that pension benefits can be affected.

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

[5] As occupational pensions make up about 35% of the retirement income of the median household (Knoef et al., 2016), unemployment can have substantial consequences for pension savings.

3 Theoretical Framework

In this section we present a theoretical model based on Rogerson & Wallenius (2016). The latter build on the seminal work by Becker (1965) and Gronau (1977, 1980) by including home production in a life cycle model with consumption and leisure to study the effects of retirement. Here we extend their approach by considering the effects of unemployment instead of retirement. In that way we develop a theoretical framework that facilitates the interpretation of the empirical results, and allows us draw conclusions about relevant elasticity parameters in the life cycle model.

Consider the utility function

$$U = \sum_{t=0}^{T} (1+\delta)^{-t} \left[u(c_t) + \theta \frac{l_t^{1-\frac{1}{\gamma}}}{1-\frac{1}{\gamma}} \right], \tag{3.1}$$

where c_t is consumption in period $t = 0, ..., T$, 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 the individual gives to leisure. The intratemporal utility function for consumption $u(c_t)$ is assumed to be strictly increasing, strictly concave, and twice continuously differentiable. In addition, we assume that c_t is a CES aggregate of consumption expenditure, c_{mt}, and home production time, h_{nt}, such that

$$c_t = \left[a c_{mt}^{\frac{\eta-1}{\eta}} + (1-a) h_{n_t}^{\frac{\eta-1}{\eta}} \right]^{\frac{\eta}{\eta-1}}, \tag{3.2}$$

where η is the intratemporal elasticity of substitution between consumption expenditure and home production.

Consider in addition the monetary budget constraint

$$A_{t+1} = (1+r)(A_{t-1} + w_t h_{mt} - c_{mt}), \tag{3.3}$$

where A_t are liquid assets, w_t denotes the hourly wage and h_{mt} is hours of market work; and the time budget constraint

$$l_t = T - h_{mt} - h_{nt}, \tag{3.4}$$

where T is the total time endowment for period t. For the sake of simplicity and without loss of gener-

ality, we assume the number of hours of market work is 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 (3.1) subject to (3.3) and (3.4). Normalizing the total time endowment to unity and substituting the time budget constraint in the utility function yields the first order conditions

$$u'(c_t)c_t^{\frac{1}{\eta}}c_{mt}^{-\frac{1}{\eta}}a = \lambda \tag{3.5}$$

and

$$u'(c_t)c_t^{\frac{1}{\eta}}h_{nt}^{-\frac{1}{\eta}}(1-a) = \theta(1-\bar{h}-h_{nt})^{-\frac{1}{\gamma}} \tag{3.6}$$

where λ is the Lagrangian multiplier. Equations (3.5) and (3.6) together with the constraints will 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 not 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 has now 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 UI benefit b_t. As long as the drop in income is expected, it will not have a contemporaneous effect on the choice of c_{mt} and h_{nt}. Therefore, in that case the optimal choice of c_{mt} and h_{nt} will only be affected by the change in the time budget constraint.[6]

Setting $\bar{h} = 0$ and substituting $w_t h_{mt}$ by b_t, the first order conditions at period τ become

$$u'(c_\tau)c_\tau^{\frac{1}{\eta}}c_{m\tau}^{-\frac{1}{\eta}}a = \lambda \tag{3.7}$$

and

$$u'(c_\tau)c_\tau^{\frac{1}{\eta}}h_{n\tau}^{-\frac{1}{\eta}}(1-a) = \theta(1-h_{n\tau})^{-\frac{1}{\gamma}}. \tag{3.8}$$

Assuming $\delta = r$ and dividing (3.7) and (3.8) by the same first order conditions at period $t = \tau - 1$, which

[6] As argued in the introduction,
the optimal choice of c_{mt} and h_{nt} upon job loss could also be affected by complementarities between consumption and leisure. Such complementarities would imply a multiplicative specification of the utility function. For the sake of simplicity we abstract from this possibility in the theoretical model.

are given by Equations (3.5) and (3.6) respectively, yields

$$\left[\frac{c_{m\tau-1}}{c_{m\tau}}\right]^{\frac{1}{\eta}} = \frac{u'(c_{\tau-1})}{u'(c_{\tau})}\left[\frac{c_{\tau-1}}{c_{\tau}}\right]^{\frac{1}{\eta}} \tag{3.9}$$

and

$$\left[\frac{1-h_{n\tau}}{1-\bar{h}-h_{n\tau-1}}\right]^{\frac{1}{\gamma}}\left[\frac{h_{n\tau-1}}{h_{n\tau}}\right]^{\frac{1}{\eta}} = \frac{u'(c_{\tau-1})}{u'(c_{\tau})}\left[\frac{c_{\tau-1}}{c_{\tau}}\right]^{\frac{1}{\eta}}. \tag{3.10}$$

Dividing (3.9) by (3.10), taking the natural log on both sides of the equality, and rearranging allows expressing the ratio between γ and η as

$$\frac{\gamma}{\eta} = \frac{\ln(1-h_{n\tau}) - \ln(1-\bar{h}-h_{n\tau-1})}{\ln(c_{m\tau-1}/c_{m\tau}) - \ln(h_{n\tau-1}/h_{n\tau})}. \tag{3.11}$$

Equation (3.11) implies that the ratio between γ and η equals the relative change in leisure time divided by the relative change in consumption expenditure minus the relative change in home production time. Both the intertemporal elasticity of substitution for leisure, γ, and the intratemporal elasticity of substitution between consumption expenditures and home production, η, are very important parameters usually employed in life cycle models. The empirical analysis we conduct allows calculating an estimate of this ratio, which in Section 7 we compare to the values usually given in the literature.

4 Empirical Strategy

The empirical strategy we employ is standard in the applied microeconomics literature. It is comparable to the methodology used in the literature studying the effects of unemployment on consumption (Stephens, 2004; Aguiar & Hurst, 2005) and time use (Krueger & Mueller, 2012; Aguiar et al., 2013). The main difference being that the availability of longitudinal data on both time use and consumption allows controlling for unobserved heterogeneity across individuals.[7]

We set up the regression equation

$$Y_{it} = \beta_0 + \beta_1 UNEMP_{it} + \beta_2' \mathbf{X}_{it} + \beta_3' \mathbf{t}_t + \alpha_i + \varepsilon_{it}, \tag{4.1}$$

[7] Krueger & Mueller (2012) use as well longitudinal data, but only on time use. Ahn et al. (2008) and Burda & Hamermesh (2010) use both data on consumption and time use. However the data are not longitudinal hence they can only perform cross-sectional comparisons.

where Y_{it} denotes a particular expenditure or time use category for individual i at period t; $UNEMP_{it}$ is a dummy variable taking 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, educational level, and household income; $\mathbf{t}_t$ 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 expect to be either positive or negative.

We first estimate β_1 by pooled OLS which exploits variation both between and within individuals. These estimates are comparable to those in Ahn et al. (2008) and Burda & Hamermesh (2010) in that they rely on comparing individuals who are unemployed with those who are not. They cannot be interpreted causally and we provide them for the purpose of showing how unemployment correlates with the expenditure and time use categories we analyze. Secondly, we re-estimate β_1 by including an individual fixed effect in the estimation equation. These estimates are comparable to those in Krueger & Mueller (2012) in that rely only on variation within individuals over time. Therefore, they can be interpreted more causally.

As an extension to the analysis, we re-estimate Equation (4.1) by taking first differences and accounting for job loss expectations in the same way as Stephens (2004). The latter estimates the effect of a variable equal to a job loss dummy, i.e. a dummy taking value one if an individual incurs a job loss between periods t and $t-1$, minus the self-reported job loss probability at $t-1$. Similarly to using fixed effects, This method controls for unobserved heterogeneity across individuals and, in addition, it isolates the unexpected component of the job loss event. We do not consider this as our baseline strategy since, according with the theory, changes that re due to expenditure home-production substitutability and expenditure-leisure complementarity may take place regardless of whether the job loss is unexpected.

5 Data and Descriptive Statistics

To implement the empirical strategy we use 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 representative of the Dutch population and is run every year since 2007. In the 2009, 2010, 2012, 2015, 2017, and 2019 waves it was supplemented with an additional module on time use and expenditure. We use this six waves in the analysis.

To implement our empirical strategy, we select household heads who are aged 25 to 64, who are either employed or unemployed, and have no missing data on employment status, expenditure, and time use.[8] In addition, we drop observations that are in the top percentile of any expenditure or time use category. In that way, we exclude a few observations with unreasonably high values. This leaves us with a sample for the expenditure analysis containing 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. The difference is due to a large amount of missing values for the time use data.

5.1 Unemployment

Figure A1 in the appendix shows that during the 2003-2019 period unemployment in the Netherlands has fluctuated between a low of about 4% in 2008 and 2019, and a high of about 8% in 2014. From a European perspective these are rather low unemployment rates. However, the duration of unemployment is relatively high in the Netherlands. According to the OECD (2019b), the share of unemployment spells shorter than a month is only about 6% in the Netherlands. In the USA, the UK, and Germany this is about 30%, 15%, and 10%, respectively. In addition, more than 40% of all unemployment spells take longer than one year in the Netherlands. This is about 20%, 30% percent, and 40% in the USA, the UK, and Germany, respectively. Among OECD countries this share is only higher in Belgium, Greece, Ireland, and Portugal.

In our sample we consider and individual to be employed if he/she reports to be in paid employment, working in family business, or in self-employment; and we consider an individual to be unemployed if he/she reports to be looking for job after an involuntary job loss or is a first time job seeker. With this definition we get an average unemployment rate of 3.92% in the sample for the expenditure analysis, with a minimum of 2.06% for the year 2009 and a maximum of 5.96% for the year 2015.[9]

[8] In case there is more than one adult in the household, the household head is the one with the highest personal income.

[9] In this section we report statistics that refer only to the sample for the expenditure analysis. The difference is negligible if

Since the fixed effects analysis relies on variation within individuals over time, it requires that individuals transit from employment to unemployment within the period of observation. Out of the 4,781 household heads in the sample for the expenditure analysis, 3,039 (63.56%) are observed for at least two periods. Out of these, 173 (5.69%) experience a job loss during the period of observation, meaning that they lose their job between waves $t-1$ and t while being observed in both waves.

An advantage of the LISS is that besides reporting the employment situation of respondents, it also asks respondents who are employed about the probability that they lose their job within the following year. The availability of this measure allows applying the approach by Stephens (2004) mentioned in Section 4. The drawback of using this method is that due to missing values in self-reported probabilities, the number of household heads in the sample decreases to 2,015, out of which 86 (4.26%) lose their job at some point in during the sample period. Nevertheless, Figure A2 in the appendix shows that these self-reported probabilities do have some predictive power. It shows that individuals who lose their job at wave t report higher job loss probabilities at wave $t-1$ than those who do not. Therefore, this variable provides useful information to measure the unexpected component of job loss..

5.2 Expenditures

The data on expenditures provided by the LISS are 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, insurances, alimony, debts and loans (other than mortgages), house and garden cleaning, food at home, childcare, holidays, and other. The individual level categories are food outside the home, tobacco, clothes, personal care, medical care, leisure, schooling, donations, and other. For all categories, respondents are asked to report euros spent on average per month taking the past 12 months as the period of reference.

Since it is actually rather difficult to draw a line separating individual level from household level expenditures, we add up all responses to the individual categories within a household and thus consider them at the household level as well. We deflate all categories using the consumer price index, and add

we use the sample for the time use analysis.

together household and individual categories to obtain a measure of total household expenditure. In the empirical analysis we estimate Equation 4.1 using total expenditure as a dependent variable and then re-estimate it separately for each expenditure category. A disadvantage of these data is that the categories reported at the individual level are only available for the 2009, 2010, and 2012 waves. For the remaining waves, i.e. 2015, 2017, and 2019, the LISS only provides the total of individual expenditures for each household member without the breakdown by category.

Pooling all waves together, average total household expenditure in the sample is 2,122 euros per month. Out of this, 81.08% corresponds to the categories considered at the household level by the LISS. Among these categories, those with the largest share of total expenditure are mortgages (21.46%) and food at home (15.08%), followed by insurances (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 share of total average expenditure is clothes (4.80%), followed by food outside the home (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%).

5.3 Time use

Regarding the time use data, the LISS module time use and consumption asks respondents about the amount 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. The first six categories, i.e. from paid work to helping non-family members, are provided in all waves. The rest are provided only in the first three waves and in the last one, i.e. the waves in 2009, 2010, and 2012, and 2019, except for the categories personal care, and administrative chores, which are 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),[10] administrative chores (2.84), and schooling (1.54). In addition to the module on time use and consumption, the LISS provides a module on social integration and leisure that contains information on subcategories of home production and leisure. We use these subcategories to expand the baseline analysis which focuses on the more general above-mentioned time use categories.

6 Estimation results

6.1 Expenditures

Tables 1 and 2 present the estimates of β_1 in Equation 4.1 for the expenditure categories reported at the household level and the individual level respectively. In addition, Table 1 provides the results for total expenditure. In both tables, Column (1) provides the OLS estimates when excluding all control variables from the model thus setting $\beta_2 = \beta_3 = 0$, Column (2) provides the OLS estimates when including the control variables and the vector of time dummies, Column (3) provides the estimates obtained when including a household fixed effect in the model thus controlling for α_i, while Column (4) provides the results of the first differences estimation accounting for job loss expectations as in Stephens (2004). Summarizing, the first two columns report the effects of being unemployed, while the second two report te effects of incurring a job loss.

The first row in Table 1 shows that, regardless of the estimation method, we find significant drops in households' total expenditure at job loss of the household head. Column (1) shows that households where the household head is unemployed spend 434.81 euros less a month on average than households where the household head is employed. Controlling for observed characteristics substantially lowers the decrease in total expenditure, while controlling for unobserved heterogeneity via fixed effects does not lower it as much.[11] In addition, Column (4) shows that isolating the unexpected component of job loss yields a stronger effect compared to the fixed effects estimation. This result is in line with the canonical life cycle model which predicts that individuals will only react to changes if they are unexpected. These results imply that, depending on the estimation method, the effects range from 5.13% to 20.49% of

[10] Informal care is the addition of time spent helping parents, other family members, and non-family members.

[11] This suggests that it is most important to control for observed heterogeneity. We expect that omitted variable bias from unobserved heterogeneity is already reduced to some extent by the fact that we estimate the effects of involuntary unemployment, as opposed to voluntary non-participation in the labor market.

average total expenditure. Therefore the decline in total household expenditure is less than the decline in income imposed by the Dutch UI benefit system on the individual becoming unemployed, i.e. 30%.

Regarding the expenditure categories, the estimated effects become (nearly) insignificant in all cases once we control for unobserved heterogeneity. However, Columns (4) in Tables 1 and 2 do show evidence of households significantly cutting expenses on insurances,[12] debt, medical care, and donations as a response to unemployment shocks. The result for the debt category indicates that households reduce debt repayment when becoming unemployed. Since debt repayment can be seen as a form of saving, this result suggests that households may chose to decrease saving as opposed to reducing other types of expenditures when faced with job loss.[13] More generally, these results suggest that job loss may be harmful for households' balance sheets beyond the direct effect on current expenditure as they imply less insurance coverage, decreased saving, and less use of medical care. An unemployment spell therefore has potential long-term consequences due to an increased exposure to (financial) risks.

Following the logic in the model in Section 3, we would expect to find declines in expenditure categories that are most easily substituted by home production, i.e. house and garden cleaning, food outside of the home, and childcare. However, when re-estimating 4.1 using the addition of these three categories as a dependent variable we estimate an effect of -9.202 (-4.561) with OLS controlling for observables (fixed effects). This estimate is not significantly different from zero and represents only 7.24% (3.59%) of the dependent variable's mean. In addition, if there is complementarity between expenditure and working and/or leisure time, we would expect to find an effect for categories such as transport, holidays, and leisure. Even though we do find a decline in transport expenditures, likely reflecting the complementarity between working and commuting,[14] we do not find and effect for any of the categories related to leisure. The latter result is in line with the findings by Krueger & Mueller (2012) who argue that leisure time is less valued during an unemployment spell due to a decline in emotional

[12] Even though insurances often entail long-term contracts, our measure also includes expenditure on basic and additional health insurances which can be changed once a year. This result suggests that unemployment leads to shopping for a cheaper health insurance or cutting on additional health insurance.

[13] Recent evidence from Herkenhoff (2020) suggests that the possibility to reduce saving mitigates the impact of recessions substantially.

[14] Column (4) of Table 1 shows that the effect for transport expenditures disappears when estimating the effect of unexpected job loss. However, expenditures that are complementary to work/leisure should be affected regardless of unemployment expectations. Therefore, we pay less attention to Column (4) in this case.

well-being.

Regarding other expenditure categories, upon controlling for unobserved heterogeneity we find remarkably small effects for expenses on mortgages, rent, utilities, alimony, food inside the home, tobacco, clothes, personal care, and schooling. That is the case even when several of these categories, i.e. mortgages, rent, utilities, and food at home, represent a substantial share of total expenditure. This may be explained by the fact that these categories have no home produced substitutes and/or they represent goods and services with low income elasticity. In addition, categories like mortgages, rent, and utilities are often subject to long-term contractual agreements. This implies that a substantial fraction of households' total expenditure cannot be flexibly adjusted. As suggested by Chetty & Szeidl (2007, 2016), this may be an important factor in explaining the lack of a larger response of expenditures to job loss.

6.2 Time use

Table 3 presents the estimation results of the effect of job loss on the time use categories provided in the module on time use and consumption within the LISS. As expected, we find that unemployment has substantial negative effects on hours dedicated to paid work. The estimated effect on working hours is about 20-28 hours per week, depending on the empirical specification. This drop is less than the full time 40 hours per week since our sample includes individuals who work part time, as well as unemployed individuals that report above zero hours of paid work.[15] In addition, we estimate substantial drops in time spent commuting of up to about 3.5 hours per week. This result is in line with the reduction in transport expenditures reported in Table 1, and it implies a substantial addition to the amount of hours freed up as a result of the reduction in working hours.

Regarding household chores, which will mostly include home production activities such as cooking and cleaning,[16] Table 3 reports substantial increases in the time spent on this category. More specifically, Columns (3) and (4) show that job loss increases household chores by about 5 to 7 hours per week on average. This implies that home production absorbs about a quarter of all lost working hours. Though slightly smaller, this result is comparable to the one reported by Aguiar et al. (2013) based on state-

[15] The sample average of reported weekly hours of paid work is 35.36 for employed individuals, while it is 7.67 for unemployed individuals. The difference between these two averages is the estimate reported in Column (1) of Table 3, i.e. -27.69.

[16] When answering this question, the LISS respondents are asked to think about cleaning, cooking, laundry, shopping, and gardening.

level variation in the USA. Categories such as activities with children and informal care could also be considered to be home production, since there is the possibility to substitute these activities with paid childcare and formal care respectively. However, even though Columns (1) and (2) do report significant correlations for these categories, accounting for unobserved heterogeneity renders the effects (nearly) statistically insignificant.

Table 3 reports as well substantial increases in time allocated to leisure following job loss. More specifically, Column (3) reports an increase of 8.28 hours per week.[17] This implies that leisure absorbs about a third of all lost working hours on average, and that leisure and home production together absorb more than half of all lost working hours. 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 expenditure are not complementary for the unemployed. Consistent with Krueger & Mueller (2012), this suggest that leisure time is relatively low-valued during an unemployment spell.

As mentioned in Section 5.3, as part of its core study the LISS provides a module on social integration and leisure that contains subcategories of home production and leisure. This module has been run every year since 2008 and up until 2018. Therefore, it provides a much broader sample than those used for the analyses in Tables 1 to 3.[18] Out of all the time use categories reported in this module, we provide the results for four categories related to home production (i.e., small jobs in and around the house, caring for plants or animals, cooking, and shopping), seven related to leisure time (i.e. sports, TV watching, radio listening, reading, musing listening, going out, and volunteering), plus an additional category in which we add all other categories reported in this module.[19] Just like for the time categories in Table 3, time spent in these categories is provided in hours per week.

Column (3) of Table 4 shows that the increase in home production due to job loss reported in Table 3 partially comes from increases in small jobs in and around the house,[20] caring for plants and animals,

[17] In this case, Column (4) shows that the effect becomes statistically insignificant when estimating the effect of unexpected job loss. However, we rely more here on the fixed effects estimation, since time use responses are more likely to take effect after the change in the time budget due to job loss, regardless of whether the latter is expected or unexpected.

[18] The number of household-year observations increases in this case to 15,454.

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

[20] It is unclear which activities are captured by this first category. It probably captures home repairs and improvements.

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 (5.49). This means that there are other potentially relevant subcategories of home production that we cannot measure separately. House cleaning is likely to be an important missing category here.

In addition, the results in Table 4 indicate that much of the increase in leisure time corresponds to time spent watching TV. Time dedicated to sports, reading, volunteering, and other activities also increase with job loss. However, together they account for around one third of the increase in leisure time reported in Table 3, while watching TV alone accounts for about a half of that increase. In addition, we find no increase in going out, which is potentially a more expensive activity. This result is again in line with the idea that individuals do not attach a high value to leisure time during unemployment and that it is not complementary with types of consumption that increase expenditure.

6.3 Intensive Margin

For completeness, it is important to study whether changes in hours worked along the intensive margin have different effects compared to changes in the extensive margin. Workers may be subject to part time employment and/or temporarily short-time work schemes, and it is relevant to study what are the consequences of these arrangements in terms of time use and consumption. In this section we present the estimation results we obtain when using effective hours worked as explanatory variable instead of an unemployment dummy.[21] Compared to the analysis in Sections 6.1 and 6.2, it is more difficult to achieve causal identification when estimating the effects of the intensive margin in hours worked. That is because working hours may decrease voluntarily and/or as a response to an increase in time spent in another activity. Therefore, in this section we interpret all results provided as mostly descriptive.

The results we obtain for expenditures show virtually no effect of a change in the number of hours of work per week.[22] When estimating the effect by OLS without controlling for observable characteristics, we do find that a one hour change in work time per week is associated with a change of about 10 euros of total household monthly expenditure. However, when controlling for unobserved heterogeneity, the

[21] For this analysis we use the same use in Table 3 but exclude unemployed workers. If we include them the change in the results is negligible.

[22] For the economy of space, we do not provide these results here. They are available upon request.

coefficient estimates for all categories become very small, i.e. in all cases between 1 and -1, and not significantly different from zero. This suggests that households are generally able to maintain their level of expenditure when changing their working hours along the intensive margin.

Regarding the time use categories, we find substantial time reallocations associated to changes in hours worked. Compared to the results in Table 3, we find statistically significant effects for a larger number of time use categories. However, the effects generally point in the same direction. We estimate the strongest effect for leisure activities, which increase by about half an hour for each hour of work reduction, followed by sleeping and resting and household chores, both of which increase by about 0.1 hours for each hour of work reduction. Similarly to the extensive margin, we find that work reductions lead to a decrease in commuting time. In this case we find a 0.1 hours increase for each hour of work reduction. Our results are comparable to those obtained by Aguiar et al. (2013) in that they also find that leisure time absorbs about 50% of the change in hours worked. However, they find about 30% of that change is absorbed by home production, while we find a much smaller effect for the household chores category. This difference indicates that substitution between expenditures and home production may be more important in the USA than in the Netherlands.

7 Quantitative implications for the Life Cycle Model

Equation 3.11 in the theoretical framework in Section 3 provides a mathematical 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. These two parameters 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 life cycle model.

The literature on the estimation of γ typically finds estimates of the range between 0.4 and 0.8, while the literature on estimating η usually reports values in the range of 1.7 to 2.5.[23] These values imply a large degree of concavity in the utility function, which indicates that individuals are risk averse and

[23]For the literature on estimating γ, see for instance Pistaferri (2003) and Chetty (2012). For the literature on estimating η, see for instance Aguiar & Hurst (2005) and Aguiar & Hurst (2007a). For a review of both strands of literature, see Rogerson & Wallenius (2016).

like to smooth consumption and leisure over time; and that expenditures and home production can be substituted fairly easily with each other. Rogerson & Wallenius (2016) propose $\gamma = 0.4$ and $\eta = 2$ as the consensus estimates in the literature which results in $\gamma/\eta = 1/5$.

According to Equation 3.11, this ratio is equal to the relative change in leisure due to unemployment divided by the difference between the relative change in consumption and the relative change in home production. Substituting into the formula the estimated relative changes in total expenditures, time dedicated to leisure activities, and time dedicated to household chores, provided in Column (3) of Tables 1 and 3, we obtain

$$\frac{\gamma}{\eta} = \frac{\ln(1.2576)}{\ln(1.0541) - \ln(0.6528)} = 0.4783, \tag{7.1}$$

which is much closer to 1/2 than to 1/5. For the case of retirement, 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 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 $1/2$.

An important limitation of the calculation by Rogerson & Wallenius (2016) is that they do not have data on consumption, hence they rely on general evidence in the literature to calculate the change in total consumption 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. (2019), there are only a few categories of expenditure than can be substituted by home production. If we re-calculate γ/η only using expenditure categories that can potentially be substituted by home production, i.e. house and garden cleaning, food outside the home, and childcare, and add activities with children to the household chores time use category, we obtain

$$\frac{\gamma}{\eta} = \frac{log(1.2576)}{log(1.0372) - log(0.7161)} = 0.6188. \tag{7.2}$$

For a fixed value of γ, this result implies an even lower value of η compared to the calculation in Equation 7.1, implying even lower substitutability between expenditure and home production. Assuming unity as

a lower bound for η,[24] the calculation in Equation 7.2 implies values of γ near the upper end estimates in the literature. This result would imply that there is very low substitutability between expenditure and home production, and it is consistent with the fact that, even though we find a strong increase in time spent on home production after a job loss, we do not find find a drop in expenditures that are substitutable by home production. This suggests that the increases we find in home production have more to do with the fact that, as argued by Pollak & Watcher (1975) and Kerkhofs & Kooreman (2003), there may be a leisure component in activities such as cooking, gardening, or childcare, rather than being a substitute for certain categories of expenditure.

8 Conclusion

In this paper we exploit micro panel data with detailed information on a wide variety of expenditure and time use categories to analyze the effects of unemployment on time use and consumption. We find that total household consumption drops by about 5% when the household head becomes unemployed. The decline becomes about 15% when accounting for subjective job loss expectations in the specification. Most of this effect is due to declines in the expenditure categories of transport, debts and loans, insurances, medical care, and donations. The statistical significance of these effects is rather low, and they are 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 is rather generous. It may also have to do with the fact that a few categories that represent a large share of expenditures are subject to long-term contractual agreements and thus cannot be easily adjusted, i.e. mortgages, rent, and utilities.

Interestingly, we do not find a decrease in expenditure categories that can potentially be substituted by home production. In addition, we do not find an increase in expenditures related to leisure activities. These results contrast with the fact that we do find clear increases in time dedicated to household chores and leisure activities in the time use analysis. These are the two time use categories that increases the most due to job loss, and they account for about quarter and a half of all lost working hours respectively.

These results suggest that there is no complementarity between expenditures and leisure time during

[24] Values of η below one would imply that expenditures and home production are actually complements rather than substitutes.

unemployment, which is in line with Krueger & Mueller (2012) who argue that individuals do not typically enjoy free time during unemployment as much as they do when they are working. However, we do find a clear complementarity between time spend working and expenditure on commuting. In addition, the results indicate that the increase in time dedicated to household chores is not due substitution between expenditures and home production. This contrasts with the results by Aguiar & Hurst (2007a) and Been et al. (2019) who find evidence for substitution for the USA. Rather than pointing at substitution for expenditures, the increase in time dedicated to household chores we observe points at the fact that, as suggested by Pollak & Watcher (1975) and Kerkhofs & Kooreman (2003), there might be a leisure component to certain home production activities.

Combining our empirical results with the theoretical model we obtain a value of about 1/2 for the ratio between the intertemporal elasticity of substitution for leisure and the elasticity of substitution between expenditures and home production. This result contrasts with the value obtained by Rogerson & Wallenius (2016) which is very close to one. This difference is probably due to the fact that the latter study the case of retirement instead of unemployment, in a different context than we do (USA), and combine very different sources of data into the calculation while we use only one source of data.

In addition, we show that using in the calculation only information on expenditures that are potentially replaceable by home production, the ratio of elasticities becomes about 2/3, which means that using only total expenditure can have an effect on the result. Assuming a lower bound for η equal to one, and taking into account that the literature typically estimates values for γ within a range between 0.4 and 0.8, a ratio of 2/3 implies that γ near the upper end estimates in the literature, while η is just above one. This result confirms that substitutability between expenditure and home production in the Netherlands is rather low. This is particularly the case specially when compared to the American context, for which Aguiar & Hurst (2007b) and Been et al. (2019) estimate a much larger potential for substitution.

In summary, our results show small drops in consumption and large increases in time spent on household chores and leisure activities, and they imply that, in the Netherlands, there seems to be very little room for substitution between expenditures and home production. To a large extent, the small drop in consumption may be explained by the generosity of the UI benefit system described in Section

2. In the absence of such a system, it could be that Dutch households were more willing to substitute expenditures by home production. Nevertheless, our results do strongly suggests two relevant points: first, that there is lack complementarity between expenditure and leisure activities during unemployment; and second, that there may be a leisure component to certain home production activities, both of which remain to be interesting venues for future research.

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Tables

Table 1: Results - Total Expenditure and Household Level Expenditures

Dep. variable	Mean	(1) OLS-1	(2) OLS-2	(3) FE	(4) FD
Total	2122.392	-434.809***	-217.212***	-108.949*	-380.866**
		(56.364)	(52.214)	(63.769)	(174.760)
Mortgages	455.503	-210.001***	-118.352***	19.702	77.531
		(22.583)	(21.329)	(20.359)	(67.174)
Rent	111.000	115.058***	76.047***	-16.115	-27.282
		(14.695)	(14.166)	(10.995)	(41.167)
Utilities	181.088	2.865	4.425	12.829*	-15.908
		(5.862)	(5.640)	(7.028)	(25.143)
Transport	132.114	-34.847***	-26.434***	-22.051***	-38.821
		(5.364)	(5.095)	(7.055)	(28.026)
Insurances	197.806	-25.31***	-19.03***	-5.85	-77.32**
		(7.402)	(6.961)	(9.638)	(38.470)
Alimony	17.432	-5.889**	-9.315***	-3.800	3.844
		(2.741)	(2.863)	(4.258)	(14.728)
Debts and loans	30.621	8.540*	6.824	-8.351	-44.008*
		(5.134)	(5.230)	(6.397)	(24.491)
House cleaning	37.246	-11.601***	-8.261***	-5.378*	-13.975
		(2.069)	(2.059)	(3.211)	(9.933)
Food at home	320.058	-60.062***	-28.063***	-15.827	30.829
		(10.37)	(9.216)	(11.481)	(35.508)
Childcare	26.276	-20.274***	-2.683	-2.146	-22.523
		(2.940)	(3.098)	(5.767)	(25.475)
Holidays	112.524	-48.609***	-17.280**	2.514	-9.092
		(7.746)	(6.862)	(10.541)	(19.265)
Other	93.391	-25.642***	-24.877***	-14.116*	-39.191
		(4.968)	(5.020)	(7.729)	(35.918)

Table 2: Results - Individual level Expenditures

		(1)	(2)	(3)	(4)
Dep. variable	Mean	OLS-1	OLS-2	FE	FD
Food out	63.571	-6.091	-2.910	5.373	3.162
		(6.474)	(6.549)	(9.159)	(18.802)
Tobacco	21.004	2.999	1.045	-3.636	-18.900
		(3.116)	(3.155)	(4.456)	(12.546)
Clothes	105.925	-18.644**	-6.579	-4.698	-23.803
		(8.453)	(8.109)	(10.394)	(36.150)
Personal care	42.530	-0.783	1.616	1.138	-1.001
		(3.416)	(3.300)	(5.469)	(14.026)
Medical care	24.288	3.210	2.440	-12.804**	-40.771*
		(3.187)	(3.110)	(5.780)	(23.684)
Leisure	59.964	-9.795**	-5.880	-10.125	-34.297
		(4.488)	(4.432)	(6.629)	(21.629)
Schooling	11.275	-1.241	0.242	1.324	-26.042
		(2.875)	(2.862)	(6.080)	(22.414)
Donations	48.230	-8.597**	-6.191	-8.364*	-49.196**
		(4.159)	(4.086)	(4.884)	(22.032)
Other	15.455	-2.026	-2.434	-2.027	-7.896
		(1.724)	(1.789)	(4.140)	(7.411)

Table 3: Results - Time Use

Dep. variable	Mean	(1) OLS-1	(2) OLS-2	(3) FE	(4) FD
Paid work	34.139	-27.698***	-25.636***	-19.612***	-26.794***
		(0.832)	(0.831)	(1.367)	(4.233)
Commuting	4.434	-3.109***	-2.671***	-2.474***	-3.538***
		(0.182)	(0.181)	(0.280)	(0.842)
Household chores	10.331	6.474***	5.725***	5.493***	7.143**
		(0.84)	(0.82)	(1.09)	(3.50)
Activities with children	4.535	-0.912	1.329***	0.488	1.003
		(0.628)	(0.490)	(0.385)	(0.981)
Informal care	3.198	2.536***	2.245***	0.325	2.428*
		(0.476)	(0.463)	(0.556)	(1.440)
Leisure activities	32.143	8.727***	6.248***	8.281***	6.196
		(1.671)	(1.638)	(2.434)	(4.738)
Schooling	1.540	0.400	0.518	0.684	2.360
		(0.417)	(0.422)	(0.683)	(1.490)
Sleeping and resting	58.017	2.021*	1.230	0.256	2.528
		(1.110)	(1.122)	(1.685)	(4.102)
Personal care	8.325	2.630***	2.201***	0.296	3.020
		(0.596)	(0.614)	(0.775)	(1.953)
Administrative chores	2.836	1.382***	1.248***	-0.568	0.341
		(0.402)	(0.395)	(0.492)	(1.499)

Table 4: Results - Time Use (Extension)

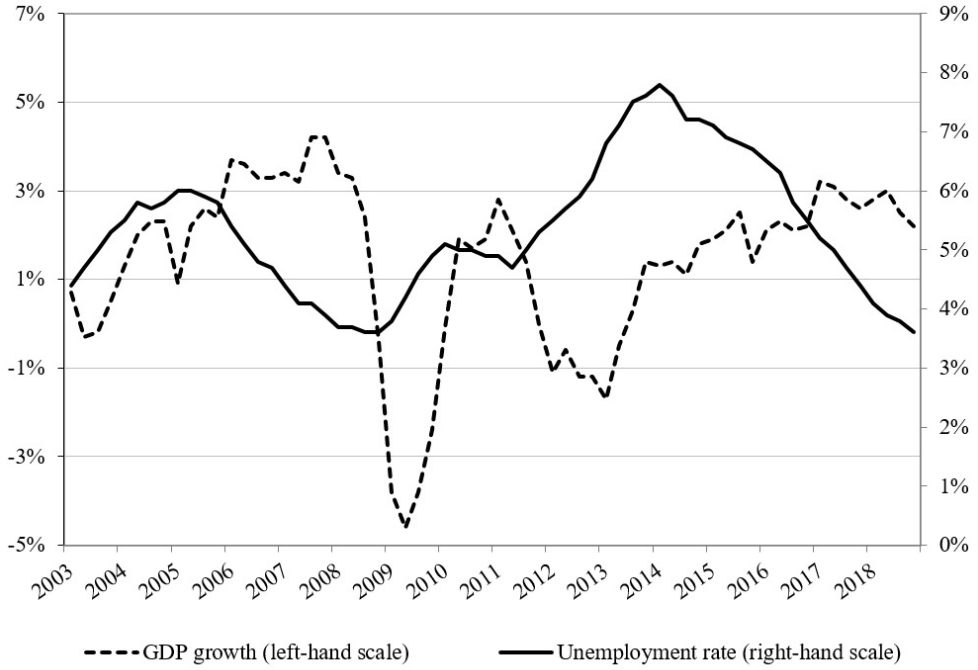
		(1)	(2)	(3)	(4)
Dep. variable	Mean	OLS-1	OLS-2	FE	FD
Small house jobs	2.974	0.713***	0.735***	0.665***	-0.332
		(0.273)	(0.275)	(0.256)	(1.005)
Caring for plants/animals	1.804	0.667***	0.524**	0.598**	0.472
		(0.235)	(0.240)	(0.242)	(0.487)
Cooking	2.680	1.254***	0.894***	0.594***	0.302
		(0.220)	(0.213)	(0.158)	(0.411)
Shopping	1.084	0.312***	0.231**	0.105	-0.353
		(0.108)	(0.105)	(0.095)	(0.359)
Sports	1.942	-0.067	0.063	0.295***	0.352
		(0.141)	(0.144)	(0.107)	(0.349)
TV watching	17.536	6.292***	5.371***	3.892***	2.311
		(0.7889)	(0.764)	(0.567)	(1.850)
Radio listening	18.04	0.868	0.493	-0.116	-4.712
		(1.252)	(1.248)	(1.025)	(3.188)
Reading	2.755	1.136***	0.815**	0.798***	1.042
		(0.379)	(0.352)	(0.280)	(0.818)
Music listening	9.653	1.877**	1.438*	-0.29	-7.243**
		(0.889)	(0.859)	(0.686)	(2.959)
Going out	1.195	-0.031	-0.058	0.128	-0.100
		(0.113)	(0.111)	(0.104)	(0.457)
Volunteering	1.102	0.864***	0.921***	0.755***	0.389
		(0.237)	(0.233)	(0.214)	(0.743)
Other activities	1.873	0.511***	0.462***	0.790***	0.713
		(0.171)	(0.170)	(0.169)	(0.522)

Table 5: Results - Intensive Margin Time Use

		(1)	(2)	(3)
Dep. variable	Mean	OLS-1	OLS-2	FE
Commuting	4.434	0.100***	0.095***	0.099***
		(0.003)	(0.003)	(0.004)
Household chores	10.331	-0.148***	-0.124***	-0.113***
		(0.011)	(0.011)	(0.018)
Activities with children	4.535	0.004	-0.045***	-0.036***
		(0.002)	(0.002)	(0.003)
Informal care	3.198	-0.040***	-0.035***	-0.012*
		(0.005)	(0.006)	(0.006)
Leisure activities	32.143	-0.479***	-0.476***	-0.525***
		(0.023)	(0.024)	(0.039)
Schooling	1.540	-0.011**	-0.011**	-0.009
		(0.005)	(0.005)	(0.006)
Sleeping and resting	58.017	-0.181***	-0.165***	-0.136***
		(0.017)	(0.018)	(0.028)
Personal care	8.325	-0.067***	-0.043***	-0.037***
		(0.007)	(0.007)	(0.010)
Administrative chores	2.836	-0.014***	-0.012***	-0.004
		(0.004)	(0.004)	(0.006)

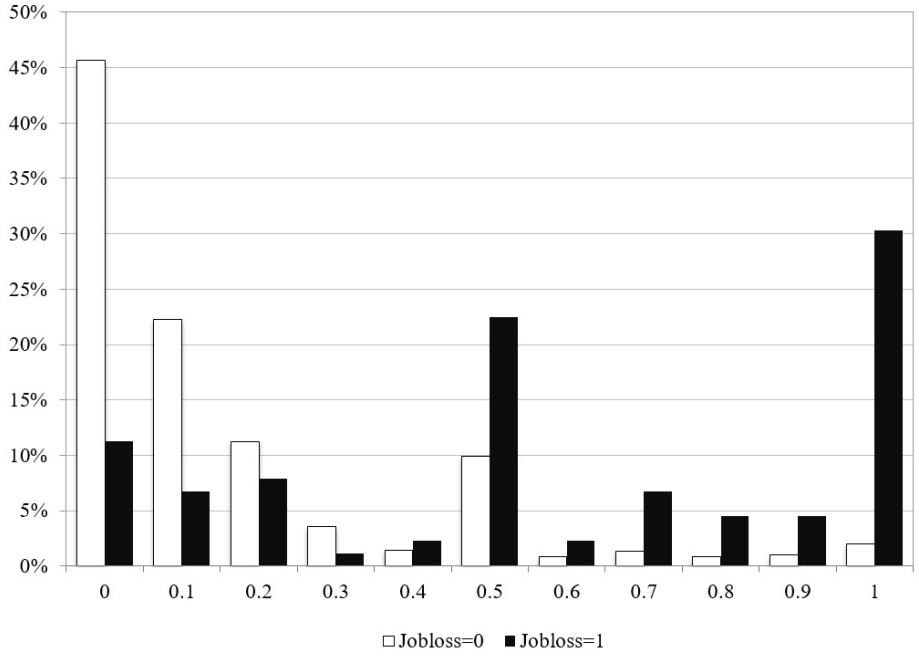
Appendix

Figure A1: Unemployment Rate and GDP Growth



Source: Statistics Netherlands. *Notes*: Data are quarterly and unemployment is seasonally adjusted.

Figure A2: Job Loss Expectations by Job Loss Outcome



Notes: Probabilities are rounded to the nearest decimal point. The vertical axis measures the percentage of individuals who report a particular probability. Job loss probabilities are measured at $t-1$ while job loss outcomes are measured at t.