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Hans G. Bloemen
Elena G.F. Stancanelli

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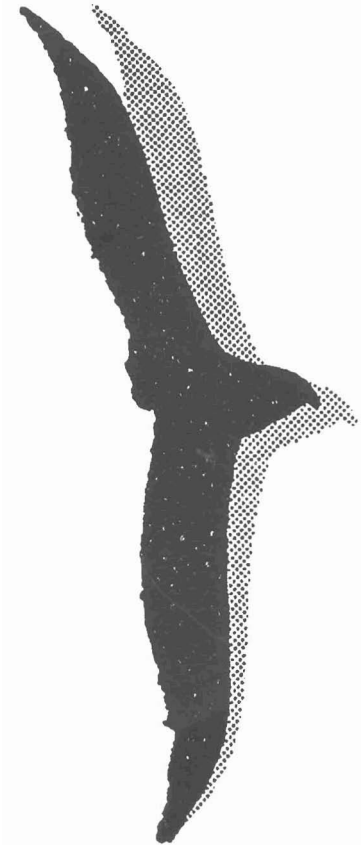

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Financial Wealth, Consumption Smoothing, and Income Shocks due to Job Loss

Hans G. Bloemen*
and
Elena G. F. Stancanelli**

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Abstract

This paper investigates the consumption and savings behaviour of individuals that have experienced a job loss. Building on the scant literature on the issue, we test for the impact of unemployment benefits on consumption levels of the unemployed. We also expand on previous work in this area by investigating the relationship between the level of benefits and the financial wealth of the unemployed. We use for the empirical analysis an unexplored dataset rick an information on financial assets of the unemployed. We conclude that there is significant heterogeneity in the consumption responses of job losers to the income shock and that, for households with no savings at the time of job loss, unemployment benefits help smoothing consumption. In particular, we find that a decrease of ten per cent in the replacement rate would lead to a fall of two per cent in food expenditure of these households. The results of estimation also suggest considerable heterogeneity in the relationship between borrowing and the level of benefits. For households running debts before job loss, a significant (negative) relationship m-as detected.

* Free University Amsterdam, Department of Economics, De Boelelaan 1105, 1081 HV Amsterdam. The Netherlands. Phone: + 31 20 4446037. Fax: +31 20 4446005. Email: hbloemen@feweb.vu.nl.

** Tilburg University and OECD, Paris

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1 Introduction

The literature on consumption has generally ignored the potential impact of unemployment benefits on consumption smoothing of the unemployed. According to the life cycle theory, an expected income shock will not influence the level of consumption, as individuals will have accumulated a sufficient level of savings[1] and will run down their assets or will borrow if their level of assets is not sufficiently high. The underlying assumption is that individuals are not subject to borrowing constraints. However, jab losers are bound to experience borrowing constraints in reality. For example, credit institutions typically use the individual's labour market status as a screening device for providing loans.

The empirical literature on unemployment benefits has not paid much attention to the consumption behaviour of the unemployed either. This in spite of the fact that income shedding motives are a rationale for providing unemployment insurance. Hamermesh and Slesnick (1995), investigating the impact of unemployment benefits on households' well-being, concluded that unemployment insurance helps to keep the consumption level of households with a job loser as high as that of other comparable households in the economy. Gruber (1997) studied the role played by unemployment benefits in consumption smoothing of the unemployed, and concluded, using PSID data for the United States, that a fall of ten percent points in the replacement ratio leads to a decrease in average food expenditure of 2.5%. Browning and Crossley (2001) put forward a theoretical model of the consumption behaviour of the unemployed, which they estimated with data on total consumption for a sample of Canadian job-losers, to find that a decrease of ten percentage points in the replacement ratio would result in a decrease in total expenditure of 0.8%.[2] Browning and Crossley (2001) included in their empirical model also an

[1] Note that in forming their expectations, individuals will also incorporate their expectations about the level of benefits.

[2] This smaller estimate than the one found by Gruber (1997) may be due to differences in the datasets used for the estimation, although typically food expenditure is less responsive than total expenditure to income shocks. Gruber (1997) used data form the PSID to estimate his model, while Browning and Crossley (2001) used data drawn from a sample of Canadians, unemployed for over six months. See

indicator for the possession of any assets at job loss, finding that the replacement rate affects consumption only when individuals hold no assets. A related issue was raised by Gruber (1999) who concluded that a higher replacement rate leads to a smaller decrease in wealth.

Here we expand on the existing literature, by looking more in depth at the relationship between accumulated wealth and consumption changes. Accumulated financial wealth may indeed be used to smooth consumption. Furthermore, low levels of financial wealth may also proxy liquidity constraints (see e.g. Browning and Lusardi, 1996). We estimate the impact of unemployment benefits on consumption smoothing, allowing for heterogeneity of households with different levels of financial wealth. In the empirical analysis, we pay particular attention to the role played by end-of-job payments, such as redundancy and severance payments, which are due to workers that have a mimimum job-tenure at the firm, in helping the unemployed to smooth consumption or to dissave less. We also investigate the relationship between changes in savings and debts levels of the unemployed and the level of the replacement ratio. Separate models are estimated for savings and debts changes to allow for a differential impact of the replacement ratio on savings and debts behaviour. For example, debt may proxy among other things also access to credit and no (lower) borrowing constraints. Again, particular attention is paid to modelling the impact of end-of-job payments, which add to the financial wealth level of job losers.

The approach followed to model the consumption behaviour of the unemployed is similar to that put forward by Gruber (1997) and Browning and Crossley (2001). We measure the consumption shock that accompanies the job loss and we estimate the impact of benefits on consumption smoothing, allowing for heterogeneity due to different levels of wealth of the unemployed.

We estimate the model with data drawn from a survey that is very rich on information on financial wealth of the unemployed, the 'Survey of Living Standards during Unemployment (LSUS)'. This covers a longitudinal inflow sample of registered unemployed in

Gruber (1999) for more details on this issue.

Great Britain in the period 1982/83. In addition to data on (food) consumption, the survey asked detailed information about ownership and amounts of various assets and debt before and after entry into unemployment. This enables us to test for the relationship between changes in wealth holdings due to job loss and the replacement ratio.

The structure of the paper is the following. The next section presents the theoretical background. The main feature of the data are described in Section 3. Some exploratory analysis of changes in consumption, savings and debt holdings is carried out in Section 4. Results of estimation of the relationship between unemployment benefits and consumption changes are discussed in Section 5. The relationship between changes in savings and debt, respectively, and unemployment benefits is investigated in Section 6 of the paper. Section 7 summarizes the results of various sensitivity checks that were performed to test for the robustness of the empirical estimates. Conclusions are drawn in Section 8.

2 Theoretical background

The life cycle theory of consumption describes the consumption and saving behaviour of individuals that decide on the intertemporal allocation of income to consumption and savings. Assets accumulation and borrowing act as smoothing devices for intertemporal consumption. Uncertainty of future income must also be taken into account to model consumption patterns. In particular, to be able to model the effect of an income shock due to job loss on consumption, the layoff probability must be incorporated into the model, as was done in Blundell, Magnac and Meghir (1997).

Let the layoff probability in period t be σ_t.[3] The intratemporal utility function will be given by $u(c_t, d_t)$, where utility in period t is a function of consumption in period t, c_t, and the labour market state occupied, d_t.

We assume that there are two labour market states, with $d_t = 1$ indicating the state of employment, and $d_t = 0$ indicating the state of unemployment.

The level of wealth at the beginning of period t is denoted by A_t. The interest rate

[3] Blundell et al. (1997) specify the staying-on probability λ_t, with $\lambda_t = 1 - \sigma_t$.

and the rate of time preference are denoted by r and ρ respectively.

An employed individual in period t receives a wage income w_t, whereas an unemployed individual in period t receives a benefit income b_t. Other income in period t, defined as μ_t, includes the income of other household members. For the sake of exposition, the income of other household members is assumed not to be affected by the job loss of the individual under consideration, at least in first instance.[4]

The intratemporal budget constraint becomes

$$c_t + A_{t+1} = rA_t + d_t w_t + (1 - d_t)b_t + \mu_t \tag{1}$$

Income uncertainty may arise due to uncertainty in the level of future wages or to uncertainty in the future level of other income or to uncertainty in the level of benefits, in the case, for example, of new policy measures in this area. In particular, the risk of layoff is a source of income uncertainty. The income loss from unemployment is measured by the replacement ratio, a: $a_{t+1} = b_{t+1}/w_t$. The layoff rate σ_t defines the probability that a job loss materializes.[5]

The objective of the individual is the maximization of the expected present value of utility, subject to the budget constraint (1).

Blundell et al. (1997) show that the usual Euler equation for consumption remains valid under this set up. Thus, for an individual employed in period t, we may write

$$\frac{\partial u(c_t^1, 1)}{\partial c_t} = \frac{1+r}{1+\rho} E_t \left((1 - \sigma_t) \frac{\partial u(c_{t+1}^{d_{t+1}^*}, d_{t+1}^*)}{\partial c_{t+1}} + \sigma_t \frac{\partial u(c_{t+1}^0, 0)}{\partial c_{t+1}} \right) \tag{2}$$

The supercript for consumption indicates that the utility maximizing level of consumption will in general differ between labour market states, due to differences in income, and in (marginal) utility. The labour market state d_{t+1}^* denotes the intertemporal utility maximizing labour market state in period $t+1$.[6] The expectation operator in (2) refers

[4] Browning and Crossley (2001) also modelled consumption at the individual level, but 'weighted' the negative income shock due to job loss with the 'importance' of the unemployed person's earnings in total household income (as we also do later, see next subsection).

[5] Notice that the layoff rate may also be subject to uncertainty because, for example, of macro shocks to the economy. In the exposition we abstract from this type of uncertainty.

[6] The determination of the optimal labour market state is a discrete choice problem, that involves the comparison of value functions in different labour market states.

to uncertainty in wages and other income. The right hand side of the Euler equation can be written more compactly, if uncertainty about layoffs is incorporated in the expectation operator, as $E_t \partial u(c_{t+1}^{d_{t+1}}, d_{t+1})/\partial c_{t+1}$. Note that the Euler equation (2) only holds in the absence of liquidity constraints.

Let us first assume that there are no liquidity constraints. The implications of (2) for the consumption and savings behaviour of individuals employed in period t are the following. In the (extreme) case in which the individual completely foresees the job loss, for example, if s/he has a fixed term appointment that comes to expiration, $\sigma_t = 1$. Assuming that the individual has knowledge of the replacement ratio that applies, the income shock is incorporated in (2). The individual knows in period t that (and how much) less income will be available in period $t+1$, and takes this into account in the allocation of the budget in period t between consumption c_t and the stock of assets A_{t+1} by consuming less and saving more than the s/he would have done in the absence of the expected job loss. The analysis can be extended by incorporating the probability of re-employment.

At the other extreme, there is the case of complete job certainty, where the risk of job loss is zero and no additional savings will be made. The average worker, however, will have a job loss probability that is between zero and one and will save, accordingly, a certain amount every period.

The standard method of estimating an Euler equation relies on recognition that the Euler equation establishes a moment condition. For this purpose, the Euler equation is rewritten as

$$\lambda_t = \frac{1+r}{1+\rho}\lambda_{t+1} + \epsilon_{t+1} \tag{3}$$

with $\lambda_t := \partial u(c_t^1, d_t)/\partial c_t$ and $E(\epsilon_{t+1}|I_t) = 0$, I_t denoting the information set at time t.[7] Next, the sample counterpart of the moment condition is formed and the Euler equation may be estimated by GMM.[8] If the sample is not selected on basis of labour

[7] Blundell et al. (1997) show that this respresentation of the Euler equation remains valid in their model.

[8] For the ease of exposition we will not go into the problem of a small number of time periods that may arise in the estimation of an Euler equation.

market movements, this is (under certain assumptions) a valid procedure: the sample frequencies of individuals who experience a job loss and those who remain employed serve as a sample counterpart for the weights (determined by the probability of job loss) attached to the marginal utility of consumption of both groups. In the present context, however, we are interested in the effect of an income shock due to job loss on consumption, and for this purpose we are interested in a sample of individuals experiencing a job loss. In general $E(\epsilon_{t+1}|I_t, \text{ job loss }) \neq 0$.[9] To accomodate for this, Browning and Crossley (2001) define the realized shock for a job loser as $\Delta_L + \nu_{t+1}$ and the realized shock for a job keeper as $\Delta_E + \nu_{t+1}$. Δ_L is called the 'permanent' shock from a job loss, i.e. the shock that is due to the revision of the marginal utility of expenditure. The term ν_{t+1} represents the impact of shocks not associated with the job loss. Then (2) implies that $\sigma_t \Delta_L + (1 - \sigma_t)\Delta_E = 0$, and

$$E(\epsilon_{t+1}|I_t, \text{ job loss }) = \Delta_L \tag{4}$$

Equation (4) is an important guideline for the empirical specification. It suggests that in a regression framework for consumption changes one needs to include covariates that are related to the 'permanent' shock (i.e. to the change in marginal utility that may come from a change in labour market state). To this purpose one may include variables that account for previous job characteristics (earnings, tenure, industrial sector) and individual characteristics like age and family composition.

However, the size of the shock at the right hand side of (4) will be influenced by whether or not the individual is liquidity constrained. In this respect, Browning and Crossley (2001) argue that the replacement ratio affects the shock, and hence enters the regression equation, if the individual is liquidity constrained. In particular, the level of asset holdings may be used as an indicator of liquidity constraints, but past earnings may also proxy liquidity constraints, as low earnings may prevent someone from accumulating savings.[10] This motivates the inclusion of past earnings and wealth in the empirical model.

[9] Only in extreme cases, like $\sigma_t = 1$, the moment condition remains valid.

[10] Saving more may cause consumption to drop below a subsistance level. Furthermore banks may not be willing to give loans to individuals with low earnings.

Finally, since the replacement rate is likely to be correlated with factors that affect the permanent shock, like the level of earnings before job loss, it is important to include a sufficient level of controls for the permanent shock to be able to measure the 'pure' consumption smoothing effect of the benefit.

From the perspective of the intratemporal budget constraint (1), the mirror image of the consumption behaviour is the saving behaviour. If individuals prefer to smooth consumption, they may run down wealth. Thus, if households are able to smooth consumption completely, we would expect to find a significant impact of the replacement rate on household wealth. Running down wealth can be achieved by running down assets and by borrowing. Any imperfections that may cause consumption smoothing to be incomplete, like borrowing constraints, or a precautionary savings motive, will also weaken the possible relationship between the replacement rate and the saving behavior of households.

The model presented allows for income shocks to affect the level of individual consumption. However, in the data, consumption is observed at the household level and the unemployed in the sample are all household heads. The effect on household consumption of the income shock experienced by the head of the household is likely to be smaller the larger are the other sources of household income. To account for this, Browning and Crossley (2001) use an 'importance adjusted' replacement ratio, which is given by the relative change in the unemployed's earnings multiplied by the 'importance' of the head's earnings (the ratio of the head's earnings before job loss to the total household income before job loss). This amounts to including the change in the head's earnings relative to the total household income.[11]

[11] This procedure is grounded in the literature on household behaviour, from which it can be formally derived. The simplest model of household behaviour is the unitary model, which assumes one household utility function and pools together the income of all household members to determine consumption choices. In the collective models, instead, the level of income of each household member contributes to determine their bargaining position within the household and may, therefore, have a separate effect on individual consumption than total household income. As information about consumption is available to us only at the household level, it is not possible to identify the unitary model from the collective model. See Fortin and Lacroix (1997) for an application of the identification above using labour supply data, where working hours are measured at the individual level.

3 The data used for the empirical analysis

The data used for the analysis are drawn from the *Survey of Living Standards during Unemployment* (LSUS). This is a longitudinal (inflow) sample of registered unemployment in Great Britain. It covers the period 1982/83, which was characterized in the UK by high and rising unemployment rates, averaging about 12-13%.

The survey sample is drawn from the registers of unemployment benefit offices in Great Britain. A sample of benefit claimants with the following characteristics was interviewed: (i) household heads, i. e. married men or single people of either gender; (ii) aged between 20 and 58 years; (iii) that started their unemployment spell in the summer of 1982. Only those individuals that remained unemployed for about three months following the start of their unemployment spell were interviewed.

The sample participants were interviewed three months after the start of their (registered) unemployment spell. The interviews were conducted personally by the interviewers at the home of the survey participants. All the information in the survey is self-reported by the unemployed. Detailed information on savings, debt and other individual characteristics was collected at the survey interviews. The interview contained retrospective questions concerning the situation one month before the start of the unemployment spell.

We use information on average weekly food expenditure, savings and debts of the unemployed at two different points in time: one month before the start of the unemployment spell (labelled time t_k) and three months into the spell (labelled time t_1). Individuals are unemployed for three months at t_1. Changes in consumption. savings and debts from t_k to t_1 are measured over a four-months period, three months of which cover a period of unemployment.[12]

Total savings is obtained by adding up the amounts of assets reported in the following categories:

[12] Browning and Crossley (20013 use data from a Canadian sample of individuals, unemployed for longer than six months. Gruber (1997) uses data from the PSID, selecting a sample of individuals that were currently unemployed but reported to be employed in the earlier wave.

- current accounts
- deposit accounts
- building societies, national savings and trustee savings accounts
- stocks, bonds and other securities

Total debt includes the following types of debt holdings:

- a loan with a bank or a finance house
- an overdraft with a bank or credit card
- any arrears with payments
- money owed to friends or relatives

We also control in the analysis for the receipt of redundancy or severance payments, due to ending of the job which precedes the start of the observed unemployment spell. These payments determine a rise in the level of assets of the unemployed, from time k to time 1 and, therefore, need to be taken account of.

To investigate the relation between the income shock and any changes in consumption, we selected a subsample of individuals that reported to be employed at t_k; reported a positive amount of net earnings at t_k; participated in the first interview (at t_1, three months after job loss); reported positive benefit income at t_1, and reported on (food) consumption levels, both at t_k and t_1. Moreover, we dropped from this sample observations with a replacement ratio (based on earnings one month before the first interview and benefits at the first interview) of 200% or more, and observations with reported relative (food) consumpion changes that exceed 200%. Thus, we are left with a sample of 1315 observations.[13]

[13] The total number of participants in the first survey is 2923. The number of individuals that reports to be employed at t_k is 1747, of which 1470 report a positive amount of earnings. Out of the sample of individuals that report to be employed and report positive earnings, 1423 report positive benefit income at t_1. However, 13 observations show a replacement ratio of 2 or larger, and 14 report a relative change in food consumption larger than 200%. Finally, for 88 observations, the relative change in food consumption from t_k to t_1 is not observed.

Table 1 presents descriptive statistics for the sample. At the first interview, t_1, all individuals in the sample are benefits claimants. The percentage of individuals that worked part time before job loss is 3.7%. In the five years preceding the survey, 45.3% had not experienced any spell of unemployment[14]; 25.1% had experienced one spell; 14% two spells and 15.6% more than two spells.

Notice that the percentage of women in the sample is relatively low (5.2%), due to the selection criterion of the sample (e.g. household heads). Most household heads (82.7%) report to be married at time t_1. Furthermore, 32.2% of the respondents in our sample report to have no children, and 29% have children younger than six.

The survey includes information on the skill level and the industrial sector of the previous job. Accordingly, we distinguish three different skill levels. The highest skill level, which includes professional and intermediate workers, interests 24.4% of the sample respondents. Skilled workers are the largest group, covering 45.5% of the sample, while the semi-skilled and unskilled worker (the lowest skill group) represent 30% of the sample. We compute five indicators for different industrial sectors, covering construction, chemistry and engineering, hotels and services, other manufacturing and other industries.

Table 2 contains sample statistics of the continuous variables. The statistics on food consumption relate to the average weekly cost of food consumption, expressed in pennies per week. The mean food consumption at t_1, three months after entry into unemployment, is lower than the mean food consumption at t_k, one month before unemployment. The same is true for all the quantiles considered of the distribution of food consumption.

We observe a large difference between the mean level of savings and the median level of savings.[15] In period t_k, one month before the start of the unemployment spell, the mean level of savings is equal to 1411 pounds, which is above the 75% quantile of the distribution (855 pounds). The median at time t_k is of 121 pounds. The percentage of individuals that report nonzero savings at t_k is 73.1%.[16]

[14] A question is asked on the number of unemployment spells in the past five years.

[15] Total savings and total debt holdings were computed adding up the savings and debt components (listed earlier on) of both the head of the household and the spouse, when present.

[16] To check the reliability of observations that reported no savings, we ran a probit regression of the probability of reporting zero savings. The results of estimation, which are presented in Appendix A,

In period t_1 we would expect individuals to run down assets, due to the loss of their job. While the median level of savings shows a decrease, the mean and the 75% and the 90% quantiles of the distribution show some increases, presumably due to the receipt of redundancy and severance payments (paid by the employer at the job loss)[17]. More analysis on savings is carried out in the next section.

If individuals do not have a sufficient amount of savings, they could run debts to finance the negative income shock from the job loss -provided that they are not liquidity constrained. From period t_k to t_1 we see a small decrease in the mean level of debts, while the median level increases from 0 to 60.

Net earnings and benefits are expressed in pennies per week. Ideally, one would like to have administrative information on benefit receipts. However, Stancanelli (1994) found that some consistency checks performed rather well. For example, she found that 71.2% of the unemployed that reported to receive unemployment insurance payments reported payments exactly equal to the official amounts, and 88.2% reported amounts that differ for less than £1 from the official figures. Table 2 shows that the average replacement ratio in the sample is 0.49. To see how much weight the earnings of the head have in total household income, Table 2 also contains the ratio of the head's earnings to the total household income at t_k. The mean (median) value for this ratio is 0.82 (0.86). The 75% quantile shows a value of 1. Table 2 contains also information on other sources of household income. This includes the income of the spouse, and housing benefits.

4 Observed changes in consumption, savings and debts

Table 3 illustrates relative food consumption changes[18] for different subgroups in the

suggest that the zero savings reports are reasonable.

[17] These payments tend to be higher for jobs with higher wages and are a function of job tenure.

[18] Browning and Crossley (2001) motivate the analysis of relative consumption changes by arguing that it is roughly consistent with studying an Euler equation with a utility function $u_t(c_t) = \delta^{-1}\{c_t(\ln c_t - 1 - \beta_t)\}$.

sample. Households may reduce expenditure on food consumption by cutting down on the amounts of food bought or by by buying cheaper, lower quality products.

The mean and median relative change in the weekly cost of consumption from period t_k to t_1 is -0.17.[19] Thus, we find a decrease in food expenditure of 17% following the job loss of the household head. Browning and Crossley (2001) found an average decrease of 14% in total expenditure, over a period of about six months of unemployment.

The subsample of households that reported positive savings show the same mean and median relative changes in consumption as the total sample. For households that do not receive redundancy payments nor severance pay (72.2% of the sample) the drop in consumption is slightly larger than for the total sample.

Next, we look at the percentage of households in the sample that experienced a decrease, no change, or an increase in consumption. We find that 37.4% of the households experience no change in consumption. This could be due to the fact that (i) we look at food consumption, which may be relatively inelastic with respect to shocks in income and (ii) we are looking at a time lapse of four months, which may be too short to observe changes in consumption for some of the households. However, interestingly, Browning and Crossley (2001) also found a peak at zero total consumption change.

On the other hand, we find that 58.6% of the households in our sample experience a decrease in consumption from t_k to t_1.[20] The percentage of households showing an increase in food consumption is only 4%. Figure 1 plots the empirical distribution of the relative change in consumption. The plot shows the peak at zero, and the probability mass for negative values of the consumption change.

Table 4 provides information on savings and changes in savings. It appears that the mean level of savings is considerably lower for the subsample of respondents who did not receive severance or redundancy payments, also at time k, before the job loss. The mean level of savings increases upon job loss, for all groups considered in Table 4. The median level, though, decreases.

[19] This coincides with a 4 month period, from one month before the transition into unemployment, to three months after.

[20] Browning and Crossley (2001) report that 51.3% of the observations in their sample show a decrease in consumption.

However, the percentage of respondents reporting positive savings falls from t_k to t_1. Initially 73.5% of the the total sample reports positive savings. Three months after job loss, this percentage falls to 67.5. Since only households reporting positive savings can run down assets, this is the more interesting subgroup to look at: the percentage reporting positive savings has dropped by almost 13%, to 87.3, three months into the unemployment spell (setting the subsample reporting positive savings at time k equal to 100).

As some of the households report zero savings, we cannot compute the relative change in savings, as we did for consumption. On the other hand, looking at changes in levels is difficult because of the large skewness of the distribution of the differences.[21] Therefore, we shall consider the 'pseudo relative change' $\Delta \ln(1+A_t)$, the change in the logarithm of one plus the level of savings.[22] The resulting empirical distribution is plotted in Figure 2 for the total sample. A large part of the peak at zero can be explained by the presence of individuals who do not report any savings before job loss.

Figure 3 plots the pseudo relative change in savings for the subgroup of respondents reporting positive savings at t_k. It shows more mass at negative values (decrease in savings) than at positive values.

Table 4 shows the mean of the pseudo relative change. For the total sample the mean is -0.4, indicating that on average the relative change in savings is negative. For households with positive savings, which are capable to run down assets, the mean relative change is -0.76. The average relative decrease in savings is the largest (-0.93) for the group of households that did not receive any redundancy or severance payments, although the mean level of initial savings is the lowest for this group.

For 41.2% of the total sample we observe a decrease in savings from one month before the job loss to three months after. This percentage is higher (56%) for the subsample of respondents reporting positive savings at t_k. For the subsample of respondents who did not receive any payments at job loss we find that 46.5% reports a decrease in savings.

[21] The skewness for changes in savings from t_k to t_1 is 7.9.

[22] In the literature, the practice of transforming data on assets by adding one and taking the logarithm to correct for the scale effects, has been applied quite often.

An important assumption of the life cycle theory concerns the ability of individuals to borrow. Table 5 shows that differences in the levels of debts run at t_k by different subsamples are not very large. Almost half of the households in the sample (48%) reports some positive debt at t_k. The percentage of households running debts is somewhat lower (46.2%) for the group of households with positive savings at t_k, and somewhat higher (51.1%) for households that did not get any job-end payments later on. There is a clear increase in the number of households running debts three months after the job loss. At t_1, 58.4% of the households report some positive debt, which amounts to an increase of 10% points. However, 42.2% of the sample experiences no change in the level of debt, whereas 24.5% sees a decrease in debt. About one third shows an increase in the level of debt.

5 Changes in consumption and unemployment benefits

As shown earlier (Table 3), the unemployed in the sample experienced on average a decrease in food expenditure of 17%, with small differences for different subsamples of the unemployed. To estimate the impact of the level of unemployment benefits on consumption of the unemployed, we proceed as follows.

We construct the replacement ratio (minus one), weighted by the importance of the household head's earnings relative to the total household income before job loss. The rationale for this choice was discussed at the end of Section 2.

In order to estimate the 'pure' effect of unemployment benefits (measured by the replacement ratio) on consumption smoothing, it is important to account for factors that may influence the marginal utility of consumption in the different labour market states and the lay-off rate, as argued in Section 2. Therefore, we include in the empirical regression variables that are related to the previous job, such as the net earnings before job loss, the skill level, the industrial sector and a dummy variable indicating whether the job was part-time. To measure the labour force attachment of the individual we use

information on previous experiences of unemployment in the five years preceding the observed unemployment spell. We also account for demographic characteristics (gender and age) and household composition, including variables for marital status, number of children, dummies for the presence of young children. We control as well for the employment status of the spouse in the year before the job loss of the head. Finally we include among the regressors variables on the financial situation of the household before the job loss (the level of savings, debts and total household income, excluding the earnings of the head of the household).

Table 6 contains the results of estimation of three regressions. The dependent variable is the relative change in consumption.

Regression 1 is the simpliest version of the model. In this regression, the importance of the head' s earnings in total household income before job loss and the replacement ratio weighted by this importance fraction show no significant effect on the relative change in consumption. The level of savings has a positive effect, though very small, on the relative change in consumption. This implies that for a household with an initial level of asset holdings that is £1,000 higher than the average, the decrease in consumption following job loss is 0.20% lower than for households with savings equal to the sample average.[23] We find a positive and decreasing effect for the amount of (lump-sum) end-of-job payments: households which receive a larger amount of end-of-job payments experience on average a lower decrease in consumption. The dummies for positive savings, positive debt and positive end-of-job payments do not show up significant. The level of net earnings before job loss is found to influence the consumption change negatively, but the marginal effect becomes smaller the larger is the level of net earnings.[24] The dummy variable for house ownership without a mortgage is significant at the 10% level: job losers who are house-owner outright, without a mortgage, experience a lower decrease in consumption (by 4.4% on average) than the other unemployed. House ownership with a mortgage does not appear to make a significant difference to consumption changes.

[23] Higher order terms of savings showed no significant effect on changes in consumption.

[24] Higher order terms of net earnings did not have a significant effect on the relative change in consumption.

Households with a head who had a part time job before job loss experience a significantly lower decrease in consumption. The difference between the marginal utility of working part time and the marginal utility of not working at all is likely to be smaller than the difference between the marginal utility of working full time and that of not working. Therefore, the consumption shock can be expected to be smaller for those who worked part time.

We included a dummy indicator for household heads that were not unemployed in the previous five years. On the one hand, we may expect that this indicator is inversely related to the lay-off rate, so that individuals that were not unemployed in the past five years may experience a larger fall in consumption. On the other hand, past unemployment may reduce the level of assets (see Appendix A). We find that households whose head was not unemployed in the past five years experience a lower decrease in consumption.

Age has a significant positive effect on the relative change in consumption.[25] Age may correlate positively with the financial position of the household. The positive effect may also reflect that the older the head of the household, the harder it is for the household to change existing consumption patterns. Finally, we see that the drop in food consumption is smaller for households with young children: this probably indicates that the presence of young children affects the marginal utility of consumption.

Regression 2 in Table 6 estimates a more flexible specification of the relation between changes in consumption and the replacement rate, which allows the impact of benefits on consumption to differ, depending on whether the individual is liquidity constrained (see the theoretical discussion in Section 2). To this purpose, the effect of the replacement rate on the relative change in consumption is allowed to differ for households reporting a positive amount of assets and/or end-of-job payments, by including cross-effects of the replacement rate with dummy variables for, respectively, positive savings and end-of-job payments.[26]

[25] A squared term of age turned out not to be significant.

[26] To make sure that the cross effects do not merely measure differences in the importance of the head's earning in total household income between households with and without savings (and with and

The estimation results in Table 6 indicate that for households who report neither asset holdings nor receipts of end-of-job payments, there is a significantly positive relation between the replacement rate and the relative change in consumption. For these households, a smaller replacement rate translates into a larger fall in consumption after the job loss: a drop in the replacement rate of 10% leads, for a household where the head's earnings are the only source of income, to a 2% fall in food expenditure.

This is a smaller effect than the 2.5% found by Gruber (1997), without distinguishing job losers by their financial situation. It is larger than the 1.3% estimate of the same effect found by Browning and Crossley (2001), for total expenditure and for households reporting no assets before job loss. However, at least qualitatively, the results from these different studies are comparable. In particular, our finding of an insignificant effect for all households might be explained by the much lower proportion (27%) of households with no savings in our dataset, than in the sample used by Browning and Crossley (2001) (66%).

Finally, in regression 3 of Table 6, we allow the impact of the replacement rate on changes in consumption to vary with the level of assets and end-of-job payments, for individuals that report positive amounts of them. The estimation results in Table 6 show that this extension of the specification does not improve on explaining the relation between the replacement rate and the consumption shock.

6 Changes in savings, debts and unemployment benefits

The descriptive statistics given in Table 4 show that households run down assets as a response to job loss. The life cycle model of consumption suggests that there is a relation between the size of the income shock and the degree to which households run down assets. In this section, we relate changes in asset levels to the replacement rate, by regressing

without end-of-job payments), we also included cross-effects of the importance weights and these dummy variables.

the pseudo-relative change in savings (from period t_k to t_1) on the replacement ratio.[27] Restricting the sample to households reporting positive savings we obtain a selective subgroup. We know (see results of estimation in Appendix A) that the probability of reporting positive savings is higher for the unemployed with higher earnings before job loss, a working spouse, fewer unemployment spells in the previous 5 years and a higher level of education (as these variables are among the factors that add to the probability of reporting positive savings). Therefore, we include an extensive set of explanatory variables also to control for the permanent shock of job loss. The analysis is to some extent comparable to Gruber (1999), who also relates the logarithm of savings to the replacement rate, using a regression framework, and excluding households reporting zero savings. However, Gruber's (1999) measures changes in savings over the unemployment spell, which is likely to differ in duration across individuals, while we measure changes in savings over a fixed period of time, from t_k to t_1, which is the same for all the unemployed in the sample. According to theoretical models (e.g. Danforth, 1979, and Blundell et al.. 1997) the level of savings itself influences the transition into a job, and consequently unemployment duration. Gruber (1999) recognizes this, and claims to have found no such relationship in his data. Stancanelli (1999), using the same data as ours, finds that the level of net wealth (measured before the start of the unemployment spell, at t_k) has a significant impact on unemployment duration. Another potential problem with the use of the household's unemployment duration as a time unit to measure changes in savings is that job search models (see e.g. Mortensen, 1986) suggest that the unemployment benefit level affects the unemployment duration.

We present results of estimation of our model in Table 7. Note that. we have included $\ln(1 + A_{t_k})$ up to the fourth power (among the regressors). Estimation by OLS indicates that all lagged explanatory variables have a significant coefficient, reflecting the considerable skewness in the distribution. Non-linearities may also reflect the fact, that households with low levels of savings run down their wealth faster than households with higher levels of savings. The importance weighted replacement rate shows no significant

[27] We do not exclude **observations reporting** zero savings at t_1.

effect on changes in savings. This is not inconsistent with the results we found for consumption in Table 6, and in particular for regression 3 in that table: adding the level of savings as an additional regressor in the equation for consumption hardly changes anything. End-of-job payments have a (decreasing) positive effect on savings, allowing households to dissave less, or even to increase savings. Age has a significantly positive impact, even after controlling for the various powers of savings and end-of-job payments, indicating that older individuals tend to dissave less. Similar findings apply to married people and to those that have not been unemployed in the past five years.

As an alternative for the OLS-regression, we ran an ordered probit regression (see Table 7), distinguishing three groups: households with an increase in savings (31% of the households reporting positive savings at t_k); households reporting no change in savings (13%); and households reporting a decrease in savings (56%). The advantage of the ordered probit model is that it is much less sensitive to skewness and noisiness in the dependent variable. The replacement rate again shows no significant effect. Finally, we ran a median regression, based on the assumption that the median of the error term, conditional on the explanatory variables, is zero. This method of estimation is less sensible to outliers than OLS. Again, we do not find a significant effect of the replacement rate on changes in savings.

Various additional (informal) sensitivity checks were carried out. For example, we did a regression of changes in savings levels for the selective subsample of households who reported a decrease in savings. No significant relation between the replacement rate and the decrease in savings could be detected. We also made a distinction between households who reported to have used all their savings from period t_k to t_1[28] and households who decreased savings but not to zero, for which a significant relationship was perhaps more likely to be found. We ran separate regressions of changes in savings for either subgroup, and also we ran an ordered probit (comparable to the regression in Table 7), with individuals reporting a decrease in savings split up in the two subgroups. None of these proved significant.

[28] There are 122 of such households in the sample, which is 9.3% of the total sample, and 12.6% of the subsample of household with positive savings at t_k.

Borrowing is another means of financing a temporary decrease in income. The regression results in Table 6 showed no impact of the level of debt before job loss on the consumption shock. However, we see (Table 5) an increase in the percentage of households running debts after job loss. Here we regress changes in debts on the replacement ratio, to investigate the ability of households to smooth consumption by borrowing.

We ran a regression with the change in the logarithm of one plus the level of debt as the dependent variable. We included all households in the sample with a dummy variable to indicate the presence of debt before job loss, as well as a fourth order polynomial in the logarithm of debt to account for differences between households with different initial levels of debt. Results of estimation are given in Table 8. Although the coefficient estimate of the importance weighted replacement ratio has the intuitively appealing negative sign (i.e. household with a higher replacement ratio on average have a smaller increase in debt) the effect is not significant. Furthermore, we see that households that receive end-of-job payments register a smaller increase in debt, on average. This is in line with the result in Table 5. Households that own a house with a mortgage register an higher than average increase in debt. This may signal easier access to credit thanks to house-ownership. Households with a larger number of children than average experience, on average, a larger change in debt.

In a next step we ran a regression in which we allowed the effect of the replacement rate on changes in debts to differ for households (not) reporting debts before job loss. The results of estimation (not shown) indicate that for households running debts before job loss, the change in debt is smaller, the higher the replacement ratio. For households reporting no debt before job loss, no significant relationship could be detected. This might imply that some households can postpone paying off debts, the lower is their replacement rate.

Then, we allowed the impact of the replacement rate on change in debts levels to differ for households (not) reporting positive amounts of end-of-job payments, as this may contribute to the determination of savings and borrowing behaviour of the households after job loss. The replacement rate was found to have a significant impact on changes in debts only for households that received end-of-job payments -perhaps signalling some

capacity to postpone paying off debts.

Finally, we ran a regression (labeled 'regression 2' in Table 8) where we allowed the effect of the replacement rate on changes in debts to be different for (i) households reporting some end-of-job payments and running debts before job loss, (ii) household not reporting any end-of-job payments but running debts before job loss, (iii) household reporting some end-of-job payments but not running debts before job loss and (iv) households not reporting any end-of-job payments nor running debts before job loss (set as the reference group). For households of type (i) and (ii), we find that the replacement rate affects significantly the change in debt, a higher replacement rate leading to a smaller change in debt. In particular, the impact of the replacement rate on the change in debt is larger for households reporting some end-of-job payments. For households not reporting any end-of-job payments nor running debts before job loss, no effect of the replacement rate on changes in debts is found.

Therefore, we ran some further tests to check whether the negative effect of the replacement ratio on the change in debt is due to households postponing to pay off debts or borrowing extra debt or a combination of the two. To this end, we split the subsample of households running debts at t_k into households with a 'low' (smaller than the median) and with a 'high' (larger than the median) value of the importance adjusted replacement rate and we looked at the distribution of changes in debt (see Table 9). For these two subsamples we determined the Table 9 shows these figures.

Households with a 'low' replacement rate appear to be paying off debts relatively less often, and running extra debt relatively more often, than households with a 'high' replacement rate. This result is even more pronounced if we separate out households (not) reporting some end-of-job payments. There is evidence that households reporting some end-of-job payments pay off debts relatively more often, but run extra debt relatively less often, than households not reporting any end-of-job payments. We conclude that the negative effect of the replacement rate on changed in debts is due to households both paying off debts and borrowing extra debt. However, there is some indication that the 'paying off' effect is larger.

Lastly, we tested for a different effect of the replacement rate on changes in debts

of households with zero savings. Given the finding that the replacement rate affects significantly the consumption of households reporting zero savings (Table 6), one might expect these households to run more debts (if they are not credit rationed). We found an insignificant effect of the replacement rate on the change in debt for households with zero savings.

7 Additional sensitivity analysis

So far the paper has not controlled for differences in expected unemployment duration between individuals. Households with an expected longer unemployment spell (or, equivalently, a lower re-employment probability) are bound to be more careful in running down assets. For them the negative income shock is likely to be somewhat more 'permanent' and consequently, they may have a higher tendency to reduce consumption. We adopted two alternative approaches to control for the impact of the expected duration of the unemployment spell on consumption smoothing and wealth decumulation.

First, additional information on regional (UK county level) unemployment rates was used to identify possible differences in expected unemployment duration. Across the sample (averaged across households), the mean of the local unemployment rate is 13.4%, whereas the minimum and maximum are respectively 5.8% and 20.2%. Households in a county with a high unemployment rate may expect the unemployment spell to last longer. Thus, we may expect a negative impact of the unemployment rate on changes in consumption, and a positive impact on changes in savings. Moveover, access to credit may be harder for the unemployed when the unemployment rate is higher.

The problem with the approach is that spacial differences in the level of unemployment may be stable over time. As a consequence, individuals living in areas with higher (lower) unemployment than the rest of the country may (not) have anticipated the job loss and accumulated more (less) savings than the average. For this reason a higher local unemployment rate may actually affect consumption in the opposite direction than an higher expected unemployment duration.

We re-ran the regressions for changes in consumption, savings and debts, including

the local rate of unemployment among the regressors. Identification in the regression equations is achieved thanks to the regional differences in the unemployment rate for different households. We found that the local unemployment rate did not have a significant effect, neither in the model for consumption, nor in the models for savings and debts. Moreover, the coefficient estimates of the other regressors were hardly affected by the inclusion of the local unemployment rate. For this reason, and for the interpretation difficulties discussed above, we decided not to include the local unemployment rate in our main regressions.

We experimented alternatively with including a measure of the expected duration of the individual unemployment spell. Using the results of estimation of a hazard rate model of unemployment estimated on the same data (Stancanelli, 1999), we computed the predicted hazard rate of moving from unemployment into employment for the household heads in the sample and added it to the regressors.[29] The coefficient estimate of the predicted hazard turned out not to be significant in any regression.

To test for the robustness of the estimates on savings, we experimented with using an alternative measure of savings that included only savings held in a current account or a deposit account. This is a more restrictive, though more homogenous, measure of savings. Moreover, it measures liquid assets.

The results of estimation of the empirical model for consumption changes remained rather stable, when this alternative measure of savings was introduced into regressions 2 and 3 of Table 6. The qualitative results of the analysis of changes in savings did not change either: no impact of the replacement rate on changes in savings could be detected.

Finally, while savings and debts have been included among the explanatory variables in our empirical model, one could argue that consumption, savings and debts are determined by the same model. In particular, the same unobserved (specific) heterogeneity

[29]There are some identification problems with this approach as the same variables which are included in the consumption equations are also included in the hazard and the theory provides no exclusion restrictions. Also, this extended model would imply that individuals can perfectly foresee the duration of their unemployment spell, which is an extreme assumption, under which individuals might also be able to smooth completely consumption.

might affect the levels of (and changes in) these three variables. This may be an argument in favour of instrumenting savings and debts. On the other hand, job losers with unobserved characteristics associated with a higher layoff rate may have accumulated a higher level of savings in the past (given everything else). Including savings may proxy for this and help to separate this effect out from the benefit effect.

Finding instruments for savings and debts is not straightforward since the theory provides no exclusion restrictions. The alternative is to use a 'reduced form' and exclude savings and debts from the consumption equation. Thus, we re-ran the regression for consumption changes excluding debts and savings from the explanatory variables. We found that the quantitative results hardly changed. This is consistent with the earlier findings of an insignificant coefficient on debts and a significant but small one on savings.

We also re-ran the regression for changes in savings without the savings and debts regressors. In this case, the coefficient estimates (and of course their interpretation) was affected -which is reasonable given the high significance of the savings regressors in our preferred empirical model (Table 7). However, the impact of the replacement rate on the change in savings remained insignificant.

8 Conclusions

In this paper, we have investigated the role of unemployment benefits on consumptions smoothing and decumulation of financial assets.

We have modeled and estimated the effect of an income shock due to the job loss of the household head on the household's consumption, savings and debts. In our model, the income shock is the decrease in the income of the household head, which is measured by the replacement ratio. According to the life cycle theory of consumption, if a downward shock in income occurs, households will smooth consumption by running down savings or borrowing. An important underlying assumption is that households are not liquidity constrained. Our model allows for credit rationing, building on the existing literature on the issue. Furthermore, the model controls for the lay-off risk as done in the most

recent consumption literature.

Using a sample of job-losing benefit-claimants from the *Survey of Living Standards during Unemployment*, a longitudinal inflow sample of the unemployed in the UK, we find that the average household in our sample experienced a decrease in (food) consumption of 17%, three months into the unemployment spell. Following job loss, we find that a smaller number of households reports positive amounts of savings and median household savings fell. Instead, the number of households running debts increased.

We have estimated the impact of the replacement rate on the consumption shock, changes in savings, and changes in debts, using a multivariate regression model. Various controls were used to disentangle the "permanent shock" of job loss from the temporary one, in order to avoid estimating a spurious relation between the replacement rate and consumption. We have specified an "importance adjusted" replacement rate, to scale the income shock with the contribution to total household income of the job-loser.

If we do not allow for heterogeneity of households behaviour, no significant relation between the replacement rate and changes in consumption is detected. If we allow the model to differ for households reporting a positive amount of savings and households reporting zero savings, we find that households reporting zero savings experience a larger decrease in consumption the lower is their replacement rate.

The quantitative implication is that a decrease in the replacement rate of 10% results in a fall in food expenditure of 2%, for households reporting zero savings. Gruber (1997), who uses US data, finds a decrease of 2.5% for all households in his sample. Browning and Crossley (2001) also found heterogeneity between households reporting positive savings and households reporting no savings. They find that a cut in the replacement rate of 10% results in a 1.3% fall in total expenditures for households that report a zero amount of assets at job loss.

Restricting our sample to households with a positive amount of savings at job loss, we did not find a relation between the replacement rate and the rate of dissaving. Gruber (1999) found that households with a lower replacement rate dissaved more.

We also found evidence of heterogeneity with respect to the relation between the replacement rate and changes in debt levels. For households running debts before job

loss, we found that a higher replacement rate led to a lower change in debt. This effect was stronger for households running debts before job loss who received some end-of-job payments. For households without debts before job loss no impact of the replacement rate on changes in debt could be detected.

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Table 1: Sample statistics: discrete background variables, sample percentages ($n = 1315$)

Gender:	
male	94.8%
female	5.2%
Marital status: (time t_1)	
married	82.7%
unmarried	17.3%
Housecownership and mortgage: (time t_k)	
houseowner without **mortgage**	8.1%
houseowner with mortgage	**32.5%**
renter	59.4%
Skill **level:**	
professional, intermediate worker	**24.5%**
skilled **worker**	**45.5%**
semi-skilled/unskilled worker	*30.0%*
Employment **status spouse** (time t_1)	
spouse employed	28.5%
spouse not employed	71.5%
Number of children (time t_1)	
no children	**32.2%**
one child	**24.0%**
two children	**26.0%**
more than two children	**17.8%**
Young children (time t_1) **(age** $<$ ***5)***	
no young children	71.0%
young children	**29.0%**
Worked part **time** before job loss	
part time	***3.7%***
full **time**	96.3%
Industrial **sector**	
othmanuf	12.1%
conctruc	16.3%
chemeng	24.9%
hotelcat	15.8%
othind	30.9%
# unemployment **spells** in past **5** years	
none	**45.3%**
one	***25.1%***
two	14.0%
more **than** two	15.6%

Table 2: Sample statistics: The distribution of continuous variables

Variable	mean	quantiles				
$n = 1315$		10%	25%	50%	75%	90%
Savings t_k	1411	0	0	121	700	2642
Savings t_1	2310	0	0	30	855	5002
debts t_k	544	0	0	0	400	1100
debts t_1	532	0	0	60	400	1070
net wealth t_k	867	-776	-170	4	500	5490
net wealth t_1	1778	-924	-263	0	701	4830
consumption t_k	3125	1500	2000	3000	4000	5000
consumption t_1	2511	1200	1800	2500	3000	4000
age t_1	38.6	24	28	37	49	55
Net earnings t_k	9610	5400	6800	8500	11000	15000
Benefits t_1	4020	2500	2520	4045	4959	6150
replacement ratio	0.49	0.21	0.30	0.44	0.64	0.80
earnings head/total househ. inc. t_k	0.82	0.57	0.70	0.86	1	1
Other income t_k	2289	0	0	1350	3405	5646
Other income t_1	2199	0	58	1170	3170	5679

Table 3: Observed relative changes in consumption

variable	observation period	total sample ($n = 1315$)	positive savings (73.5%)	no end-of-job payments (72.2%)
Mean $\Delta C_t/C_{t-1}$	Time K to 1	-0.17	-0.17	-0.19
Median $\Delta C_t/C_{t-1}$	Time K to 1	-0.17	-0.17	-0.20
% with $\Delta C_t/C_{t-1} < 0$	Time K to 1	58.6	56.3	63.0
% with $\Delta C_t/C_{t-1} = 0$	Time K to 1	37.4	40.1	32.7
% with $\Delta C_t/C_{t-1} > 0$	Time K to 1	4.0	3.6	4.3

Table 4: Observed changes in savings

variable	observation period	total sample ($n = 1315$)	positive savings (73.5%)	no end-of-job payments (72.2%)
A_t: mean savings	Time K	1411	1919	946
	Time 1	2310	3078	1049
A_t: median savings	Time K	121	306	61
	Time 1	30	183	3
Sample % with $A_t > 0$	Time K	73.5	100	68.3
	Time 1	67.5	87.3	58.7
Mean $\Delta \ln(1 + A_t)$	Time K to 1	-0.40	-0.76	-0.93
% with $\Delta A_t < 0$	Time K to 1	41.2	56.0	46.5
% with $\Delta A_t = 0$	Time K to 1	32.8	13.0	41.0
% with $\Delta A_t > 0$	Time K to 1	26.0	30.9	12.5

Table 5: Observed changes in debt

variable	observation period	total sample ($n = 1315$)	positive savings (73.5%)	no end-of-job payments (72.2%)
D_t: mean debts	Time K	544	573	577
	Time 1	532	558	635
D_t^*: median debts	Time K	0	0	20
	Time 1	60	50	105
Sample % with $D_t > 0$	Time K	48.0	46.2	51.1
	Time 1	58.4	55.7	65.6
mean $\Delta \ln(1 + D_t)$	Time K to 1	0.48	0.43	0.76
% with $\Delta D_t < 0$	Time K to 1	24.5	25.1	22.9
% with $\Delta D_t = 0$	Time K to 1	42.2	44.6	37.0
% with $\Delta D_t > 0$	Time K to 1	33.3	30.3	40.1

Table 6: OLS regression for changes in consumption

Dep. var.: $\Delta C/C$	Regression 1		Regression 2		Regression 3	
Variable ($n = 1315$)	estimate	se	estimate	se	estimate	se
Intercept	-0.16	0.10	-0.08	0.11	-0.08	0.11
Import. of inc. for househ.	-0.004	0.093	-0.023	0.109	-0.030	0.110
Import. $\times\iota(A_{t_k} > 0)$	–	–	0.11	0.09	0.11	0.09
Import. $\times\iota(endjobpay > 0)$	–	–	0.020	0.095	0.027	0.096
Importance $\times$ repl. rate	0.05	0.05	0.21	0.07	0.21**	0.07
Imp. $\times$ repl. rat $\times\iota(A_{t_k} > 0)$	–	–	-0.20**	0.07	-0.20**	0.07
Imp. $\times$ repl. rat $\times\iota(endjobpay > 0)$	–	–	-0.11**	0.08	-0.13	0.08
Imp. $\times$ repl. rat $\times A_{t_k}$	–	–	–	–	0.000	0.008
Imp. $\times$ repl. rat $\times$ endjobpay	–	–	–	–	0.009	0.016
$\iota(A_{t_k} > 0)$	0.00	0.01	-0.16	0.07	-0.17**	0.07
ι(end-of-job pay > 0)	-0.005	0.019	-0.066	0.072	-0.081	0.077
Level of savings t_k	0.0020**	0.0008	0.0016**	0.0008	0.0019	0.0059
Amount end-of-job payments	0.011**	0.004	0.008**	0.004	0.012	0.008
Amount end-of-job paym. squared	-0.000	0.000	-0.000	0.000	0.000	0.000
ι(debt $t_k > 0$)	-0.003	0.013	-0.003	0.012	-0.003	0.012
Level of debt t_k	-0.002	0.002	-0.002	0.002	-0.002	0.002
Net earnings t_k	-0.016**	0.005	-0.018**	0.005	-0.018**	0.005
Net earnings t_k squared	0.00042**	0.00010	0.00045**	0.00010	0.00044**	0.00010
Other income t_k	0.007	0.005	0.010	0.006	0.010	0.006
House owner	0.050**	0.024	0.045*	0.024	0.045*	0.024
House with mortgage	0.009	0.015	0.010	0.015	0.010	0.015
Professional, intermediate worker	0.034*	0.018	0.030*	0.018	0.030*	0.018
Skilled worker	-0.004	0.014	-0.002	0.014	-0.002	0.014
Other manufacturing	-0.018	0.020	-0.022	0.020	-0.022	0.020
Construction	-0.036*	0.019	-0.038*	0.019	-0.038**	0.019
Chemics and engineering	0.006	0.016	0.007	0.016	0.008	0.016
Hotel and catering	-0.019	0.019	-0.020	0.019	-0.020	0.019
Part time job	0.083**	0.034	0.081**	0.034	0.081**	0.034
Not unemployed in prev. 5 years	0.030**	0.014	0.031**	0.014	0.031**	0.014
Age t_1	0.0026**	0.0007	0.0026**	0.0007	0.0026**	0.0007
Woman	-0.061*	0.032	-0.059*	0.032	-0.059*	0.032
Married t_1	0.025	0.023	0.030	0.023	0.030	0.023
Number of children	0.002	0.006	0.001	0.006	0.000	0.006
Any child with age < 5	0.046*	0.018	0.045**	0.017	0.044**	0.017
Spouse employed t_k	0.001	0.019	0.006	0.019	0.006	0.020

Table 7: Regression for changes in savings, individuals reporting positive savings initially

Dep. var.: $\Delta \ln(1 + A_t)$	OLS		Ordered probit		Median regression	
Variable ($n = 967$)	estimate	se	estimate	se	estimate	se
Intercept	-2.64**	1.25	-1.05	0.80	-1.93	1.17
Import. of inc. for househ.	2.09**	1.05	0.91*	0.67	1.50	0.98
Importance × repl. rate	-0.047	0.52	0.016	0.34	-0.28	0.49
ι(end-of-job pay > 0)	0.91**	0.21	0.47**	0.14	0.47**	0.19
$\ln(1 + A_{t_k})$	0.51	0.67	-0.11	0.45	0.43	0.63
square of $\ln(1 + A_{t_k})$	-0.49**	0.22	-0.04	0.16	-0.34*	0.20
$\ln(1 + A_{t_k}) * *3$	0.073**	0.027	0.000	0.021	0.047*	0.025
$\ln(1 + A_{t_k}) * *4$	-0.0031**	0.0012	0.0003	0.0010	-0.0020*	0.0011
Amount end-of-job payments	0.25**	0.06	0.23**	0.05	0.32**	0.05
Amount end-of-job paym. squared	-0.0073**	0.0024	-0.0063**	0.0019	-0.010**	0.0022
ι(debt $t_k > 0$)	0.009	0.14	0.012	0.09	-0.029	0.13
Level of debt t_k	0.015	0.023	0.008	0.015	0.007	0.022
Net earnings t_k	-0.088	0.062	-0.051	0.046	-0.11*	0.058
Net earnings t_k squared	0.0013	0.0015	0.0002	0.0012	0.0019	0.0014
Other income t_k	0.079	0.058	0.014	0.037	0.045	0.054
House owner	0.50**	0.25	0.57**	0.17	0.27	0.23
House with mortgage	0.27*	0.16	0.17	0.11	0.38**	0.15
Professional, intermediate worker	0.26	0.20	0.20	0.13	0.15	0.19
Skilled worker	0.04	0.17	-0.13	0.11	-0.08	0.16
Other manufacturing	-0.32	0.22	-0.24	0.15	-0.26	0.21
Construction	-0.36	0.22	-0.11	0.14	-0.14	0.20
Chemics and engineering	-0.23	0.18	-0.05	0.12	-0.08	0.17
Hotel and catering	-0.78**	0.21	-0.56**	0.14	-0.50**	0.20
Part time job	0.26	0.38	-0.19	0.26	0.31	0.36
Not unemployed in prev. 5 years	0.43**	0.15	0.45**	0.10	0.30**	0.14
Age t_1	0.045**	0.008	0.016**	0.005	0.042**	0.007
Woman	0.15	0.36	0.07	0.24	-0.10	0.33
Married t_1	0.48*	0.26	0.06	0.17	0.47**	0.24
Number of children	-0.07	0.07	0.00	0.04	-0.09	0.06
Any child with age < 5	-0.24	0.20	-0.18	0.14	-0.28	0.19
Spouse employed t_k	0.30	0.21	0.30**	0.14	0.31*	0.20
Intercept 2			0.51	0.04		

Table 8: OLS regression for changes in debt

Dep. var.: $\Delta \ln(1 + D_t)$	Regression 1		Regression 2	
Variable ($n = 1315$)	estimate	se	estimate	se
Intercept	1.26	0.89	0.70	0.93
Import. of inc. for househ.	0.62	0.83	1.56*	0.91
Import. $\times \iota(D_{t_k} > 0, end - jobpay > 0)$			-2.80**	1.24
Import. $\times \iota(D_{t_k} > 0, end - jobpay = 0)$			-1.42*	0.80
Import. $\times \iota(D_{t_k} = 0, end - jobpay > 0)$			-0.80	1.17
Importance $\times$ repl. rate	-0.44	0.42	0.73	0.55
Imp. $\times$ repl. rat $\times \iota(D_{t_k} > 0, end - jobpay > 0)$			-3.43**	0.88
Imp. $\times$ repl. rat $\times \iota(D_{t_k} > 0, end - jobpay = 0)$			-1.48**	0.61
Imp. $\times$ repl. rat $\times \iota(D_{t_k} = 0, end - jobpay > 0)$			-0.43	0.99
$\iota(A_{t_k} > 0)$	0.05	0.29	0.05	0.28
ι(end-of-job pay > 0)	-1.01**	0.17		
$\iota(D_{t_k} > 0, end - jobpay > 0)$			0.40	2.81
$\iota(D_{t_k} > 0, end - jobpay = 0)$			1.54	2.65
$\iota(D_{t_k} = 0, end - jobpay > 0)$			-0.19	0.85
Level of savings t_k	-0.017	0.11	-0.010	0.11
Level of savings t_k squared	-0.003	0.010	-0.003	0.010
Amount end-of-job payments	-0.021	0.036	-0.036	0.037
Amount end-of-job paym. squared	0.0009	0.0011	0.0012	0.0011
$\iota(D_{t_k} > 0)$	0.01	2.61		
Level of debt t_k	0.55	2.05	-0.07	2.05
Level of debt t_k squared	-0.46	0.58	-0.30	0.58
Level of debt t_k ** 3	0.072	0.068	0.056	0.068
Level of debt t_k ** 4	-0.0034	0.0028	-0.0028	0.0028
Net earnings t_k	-0.001	0.044	0.017	0.044
Net earnings t_k squared	-0.0010	0.0010	-0.0013	0.0010
Other income t_k	0.040	0.049	0.037	0.049
House owner	-0.11	0.22	-0.06	0.22
House with mortgage	0.56**	0.14	0.53**	0.14
Professional, intermediate worker	0.11	0.16	0.12	0.16
Skilled worker	0.10	0.13	0.11	0.13
Other manufacturing	-0.26	0.18	-0.24	0.18
Construction	0.04	0.17	0.06	0.17
Chemics and engineering	-0.21	0.15	-0.19	0.15
Hotel and catering	0.31*	0.17	0.32	0.17
Part time job	-0.17	0.30	-0.21	0.30
Not unemployed in prev. 5 years	0.05	0.12	0.05	0.12
Age t_1	-0.015**	0.006	-0.014**	0.006
Woman	0.15	0.29	0.20	0.29
Married t_1	-0.19	0.21	-0.22	0.21
Number of children	0.13**	0.05	0.12**	0.05
Any child with age < 5	0.04	0.16	0.05	0.16
Spouse employed t_k	0.03	0.17	0.03	0.17

Table 9: Observed changes in debt for households running debts initially, for 'high' and 'low' values of the importance weighted replacement rate

variable	Households with $D_{t_k} > 0$ ($n = 631$)		Households with $D_{t_k} > 0$ no end-of-job paym. ($n = 485$)		Households with $D_{t_k} > 0$ end-of-job paym. ($n = 146$)	
	Imp. repl. rat.		Imp. repl. rat.		Imp. repl. rat.	
	$\leq$ median	$>$ median	$\leq$ median	$>$ median	$\leq$ median	$>$ median
% $\Delta D_t < 0$	49.2	52.8	41.9	47.2	66.7	81.1
% $\Delta D_t = 0$	9.2	9.2	8.6	9.5	10.8	7.6
% $\Delta D_t > 0$	41.6	38.0	49.6	43.4	22.6	11.3

We used the median of the importance weighted replacement rate for the subsample of the households running debts at t_k

A Relating the event of reporting zero savings to background variables

As a reliability check, we tried to gain more insights into the background of the individuals reporting zero savings. For this purpose, we ran an auxiliary probit regression, in which we relate 'reporting zero savings' to various background variables.[30] For example, one would expect that someone reporting zero savings does not have the earnings capacity to accumulate savings or is risk prone.

The results of the probit estimation are found in table A. Net earnings have a significant negative effect on the probability of reporting zero savings at t_k. For other income, which includes the income of the spouse, we find no effect, but individuals with an employed spouse have a significant lower probability of reporting zero savings.[31] The probability of reporting zero savings increases with the number of past unemployment spells. Households with more children have a significantly higher probability of reporting zero savings. Married people also have a higher probability of reporting zero savings. Note, though, that the positive coefficient for being married is smaller (absolutely) than the negative impact of having an employed spouse. Consequently, married respondents with a working spouse without children have a lower probability of reporting zero savings than singles. Finally, we find that the probability of reporting zero savings is lower the higher is the individual's skill level. Thus, the probit regression generates plausible results for the probability of reporting zero savings.

[30] A similar approach is followed in Stancanelli (1999) to check the plausibility of the zero savings reports.

[31] A specification without the employment status of the spouse included showed a negative, though insignifcant effect of other income on the probability of reporting zero savings.

Table A: Probability of reporting zero savings time k, probit

variable	estimate	standard error
intercept	-1.11*	0.65
net earnings/1000 t_k	-0.029**	0.009
other income/1000 t_k	0.022	0.021
spouse employed t_k	-0.39**	0.12
age t_1	0.030	0.031
age squared	-0.0004	0.0004
1 unempl. spell. past 5 years	0.37**	0.10
2 unempl. spell. past 5 years	0.39**	0.12
3 unempl. spell. past 5 years	0.52**	0.15
more than 3 unempl. spell. past 5 years	0.62**	0.14
male	0.12	0.21
married	0.28**	0.14
number of children	0.14**	0.04
young children present	-0.17	0.11
professional, intermediate worker	-0.52**	0.12
skilled worker	-0.19**	0.09
othmanuf	-0.16	0.13
construc	0.003	0.12
chemeng	-0.13	0.10
hotelcat	0.090	0.12

The value of the log-likelihood function is -744.62. In the table, a single * and a double ** indicate significance at the 10% and 5% level, respectively.

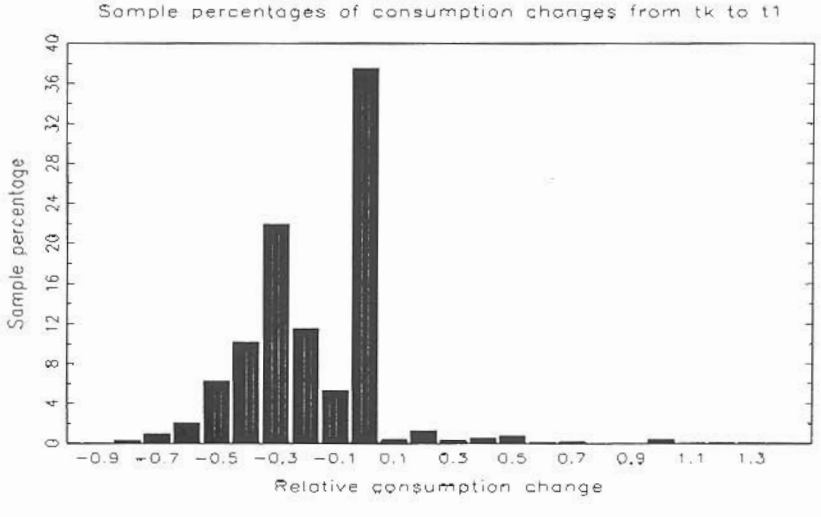

Figure 1: Distribution of observed relative consumption changes

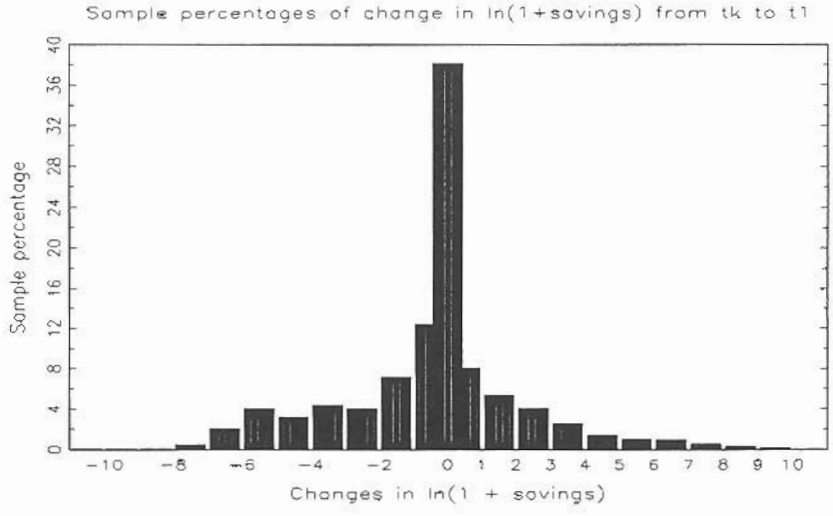

Figure 2: Distribution of observed changes in $\ln(1+A)$

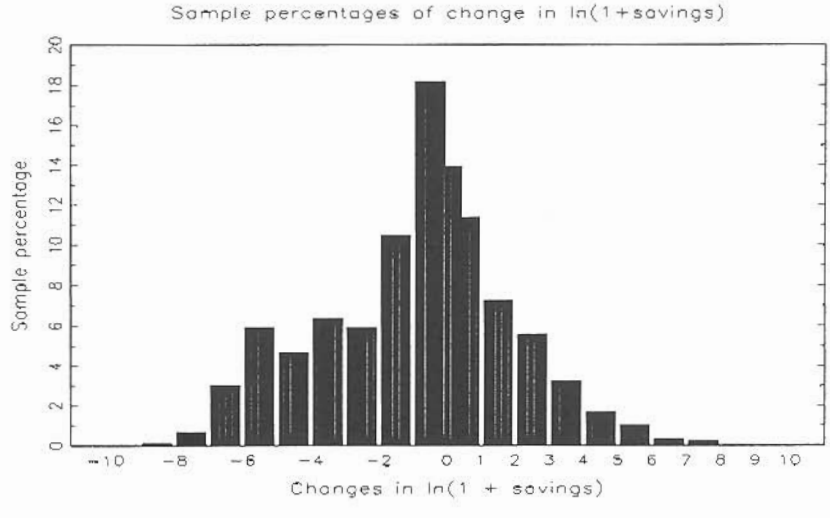

Figure 3: Distribution of observed changes in $\ln(1+A)$, subsample with positive savings