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Depressed Demand and Supply

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Abstract

We investigate the implications of experienced-based learning on consumption-saving and labor supply, two fundamental decisions in business cycle models. Using the Dutch Household Survey, we find that individuals who have experienced higher national unemployment rates over their lifetime save more, borrow less, and work less, after controlling for aggregate shocks, income, wealth, and demographics. Possibly explaining these behavioral responses, these individuals find it more important to save for retirement and to cover unexpected expenses, are more worried about losing their job, and dislike their job more. These results have implications for business cycle models and stabilization policies.

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1 Introduction

A growing literature reports that personal experience affects many economic outcomes, ranging from stock market participation (Malmendier and Nagel, 2011) to preferences for redistribution (Roth and Wohlfart, 2018), and many others. This paper builds on this literature to study the potential implications of personal experience on business cycles. More specifically, it studies the effect of experienced unemployment, a major source of household income risk, on two fundamental decisions in business cycle models: consumption-saving and labor supply.

The analysis uses the Dutch household survey (DHS), conducted annually since 1993 and covering about 2000 households. The main strength of this survey is that it combines a large number of measures of preferences, expectations, and economic behavior, which make it possible to study not only whether experienced unemployment affects economic behavior, but also the underlying channels.

Our main result is that individuals who have experienced 1 percent more unemployment over their lifetime report a 1.5 percentage point higher saving rate, a 10 percentage point lower consumer credit-to-income ratio, and work 1 hour less per week. Thus, negative economic experience depresses both demand and supply. These effects are economically significant. The saving response corresponds to a 16% increase for the average saver while the consumer credit response corresponds to a 27% decrease for the average borrower. The labor supply response corresponds to a 3% decrease for the average employee.

Further analysis suggests that greater pessimism about future economic prospects may explain the consumption-saving responses to higher experienced unemployment. Individuals who have experienced more unemployment find it more important to save for their pension and to cover unexpected expenses. Furthermore, they are more worried about losing their job and expect a lower future income.

We also find that individuals who have experienced higher unemployment are less satisfied with their job, which could explain why they work less. Alternatively, workers

may work less because they plan to spend less (or the other way around) or because they believe they will lose their job no matter how hard they work.

Overall, the results suggest that negative economic experience depresses both demand and supply. A natural interpretation for these results, which is the one that motivated us to start this project, is that personal experience changes beliefs and preferences, which in turn affects behavior. This interpretation would be consistent with the growing literature documenting the pervasive effects of personal experience.

There are a few alternative explanations, but we find them less convincing. First, individuals who have experienced higher unemployment may rationally update their beliefs about future unemployment. However, individuals do not have to be alive in a given period to know about the macroeconomic situation of this period. The time series on unemployment we use to construct our experience measure are easily available to anyone.

Alternatively, individuals who experienced higher unemployment may face poorer labor market outcomes. In particular, students who graduate during a recession earn persistently less (Kahn, 2010; Oreopoulos et al., 2012). The experience effects we document, however, seem distinct from the effect of graduating in a recession since all our results control for income and wealth. Furthermore, Kahn (2010) reports that graduating in a recession does not affect labor supply.

All our results control for year fixed effects, age, age square, income, assets, liabilities, and various demographics. The year fixed effects ensure that our results cannot be explained by aggregate shocks that affect all households at the same time in a given year. Controlling for age and age square ensures that our results are not explained by typical changes over the life cycle. Furthermore, the results remain similar if we use different weights in the experience measure or use different measures of experience (GDP growth, growing up in a recession), although the significance levels decrease. They can also be replicated using another Dutch household survey (LISS) which contains similar information but started much later (2009) and thus features less variation in unemployment experience.

The results first could have implications for business cycle models. They suggest a

possible justification for the typical assumption in business cycle models of shocks to preferences, which is typically made for convenience and lacks a deep foundation. Our results suggest that preferences may change over time as a result of changes in experience. However, they also suggest that modeling changes in preferences as shocks may not capture the whole story. Since the changes in preferences we document are related to experience, they may instead be formalized as indirect consequences of other fundamental shocks. Furthermore, such a model may create interesting dynamics or multiple equilibria because economic behavior not only directly affects the macroeconomy but is also itself influenced by the macroeconomy through changes in experience.

The results also have implications for stabilization policies. Since a negative shock decreases both demand and supply, the response of output is unambiguously negative but the response of prices is ambiguous. Thus, our results offer a possible explanation for the missing deflation puzzle (Kara and Pirzada, 2017; Lindé and Trabandt, 2018). This puzzle refers to the observation in the past decade of volatile output and unemployment but relatively stable prices. Relatedly, regulators who want to stabilize an economy where both supply and demand shift simultaneously may prefer to target economic activity rather than inflation.

The paper is related to the literature studying the role of sentiment in business cycles. Empirical studies find a positive effect of consumer confidence on the economy (Barsky and Sims, 2012; Benhabib and Spiegel, 2018; Fève and Guay, 2018; Lagerborg et al., 2019), an effect that has been attributed to information frictions or multiple equilibria. Our paper complements these studies by offering a perspective based on experience effects and individual household data.

Finally, the paper extends the growing literature on the pervasive consequences of experience on expectations, preferences, and economic behavior. It is most closely related to Malmendier and Shen (2018), who find that American households with higher unemployment experience consume less. We replicate their results when we use the LISS data, which also has measures of consumption. Furthermore, we also complement and extend their results by using measures of savings and consumer credit and by study-

ing the implications on labor supply. Experience effects have also been documented in stock market investment (Greenwood and Nagel, 2009; Malmendier and Nagel, 2011), corporate finance decisions (Malmendier et al., 2011), political preferences and beliefs (Alesina and Fuchs-Schündeln, 2007; Giuliano and Spilimbergo, 2013; Fuchs-Schündeln and Schündeln, 2015; Roth and Wohlfart, 2018; Laudenbach et al., 2019), and inflation expectations (Malmendier and Nagel, 2015).

The paper is organized as follows. The next section presents the data and shows how we measure the level of lifetime experienced unemployment. Section 3 presents our results and section 4 studies their robustness. Section 5 concludes.

2 Data

DNB Survey We use various measures of preferences, expectations, and economic behavior from the DNB Household Survey, conducted annually since 1993 and administered by CentERdata, a survey research institute at Tilburg University that specializes on Internet surveys. The survey aims to be representative of the Dutch population and provides information on about 2000 households. The purpose of the survey is to study the economic and psychological determinants of the saving behavior of households. The survey therefore also contains detailed information on household characteristics such as age, income, wealth, liabilities, family situation, gender, retirement status, education, region, etc. Households participate for as long as they want and the survey is refreshed with new households. A separate high income panel of about 1,000 households over-samples the households belonging to the 10 percent highest income group. In 1997, this high income panel was stopped due to high associated costs and the households belonging to that group were added to the rest of the panel. We exclude respondents who are younger than 25 or older than 75 and who are not employed. In a few cases, members of the same household participated to the survey and we only keep self-reported household heads. Table 1 summarizes these demographics.

Table 1: Summary Statistics - Demographics

Variable	Mean	Std. Dev.	Min.	Max.	N
Household Income	34236.783	18132.171	0	75000	15839
Age	44.085	9.987	25	75	23067
Age squared	2043.196	897.21	625	5625	23067
Number of household members	2.719	1.41	1	9	23067
Children in the house	0.484		0	1	23067
Couple	0.731		0	1	23067
Female	0.204		0	1	23067
College education	0.489		0	1	23067
High income panel	0.09		0	1	23067
Very high urbanization	0.169		0	1	22753
High urbanization	0.247		0	1	22753
Moderate urbanization	0.218		0	1	22753
Low urbanization	0.2		0	1	22753
Very low urbanization	0.166		0	1	22753
High income panel	0.09		0	1	23067

Macroeconomic Experience To measure unemployment experience, we follow Malmendier and Nagel (2011) and construct a measure of experienced unemployment during the lifetime of each individual based on the the following formula:

$$E_{it}(\lambda) = \sum_{k=0}^{age_{it}-1} w_{it}(k,\lambda) U_{t-k}$$

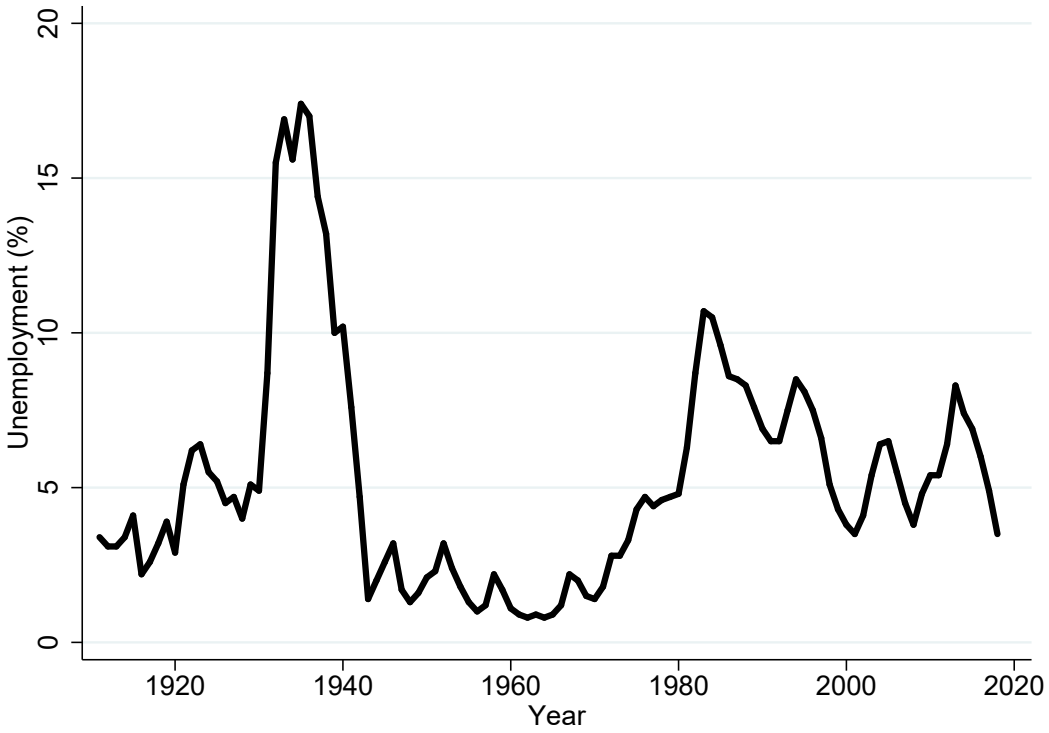
where:

$$w_{it}(k,\lambda) = \frac{(age_{it}-k)^{\lambda}}{\sum_{k=0}^{age_{it}-1}(age_{it}-k)^{\lambda}}$$

The experienced aggregate unemployment (E_{it}) of individual i in year t is given by the weighted average of the aggregate unemployment rate in each year k since birth. The weights w_{it} depend on λ. If $\lambda = 0$, each year receives the same weight and the unemployment experience is a normal average of all the unemployment rates experienced by the individual over his lifetime. If $\lambda = +1$, more weight is attached to more recent experiences. If $\lambda = -1$, more weight is attached to experiences earlier in life. Following Malmendier and Shen (2018) and other papers, we use $\lambda = +1$ for our baseline analysis. In Section 4, we replicate our results using $\lambda = +1.5$ and $\lambda = +0.5$.

To construct the measure of experienced unemployment, we use the unemployment

Figure 1: Unemployment rate from 1910 to 2018



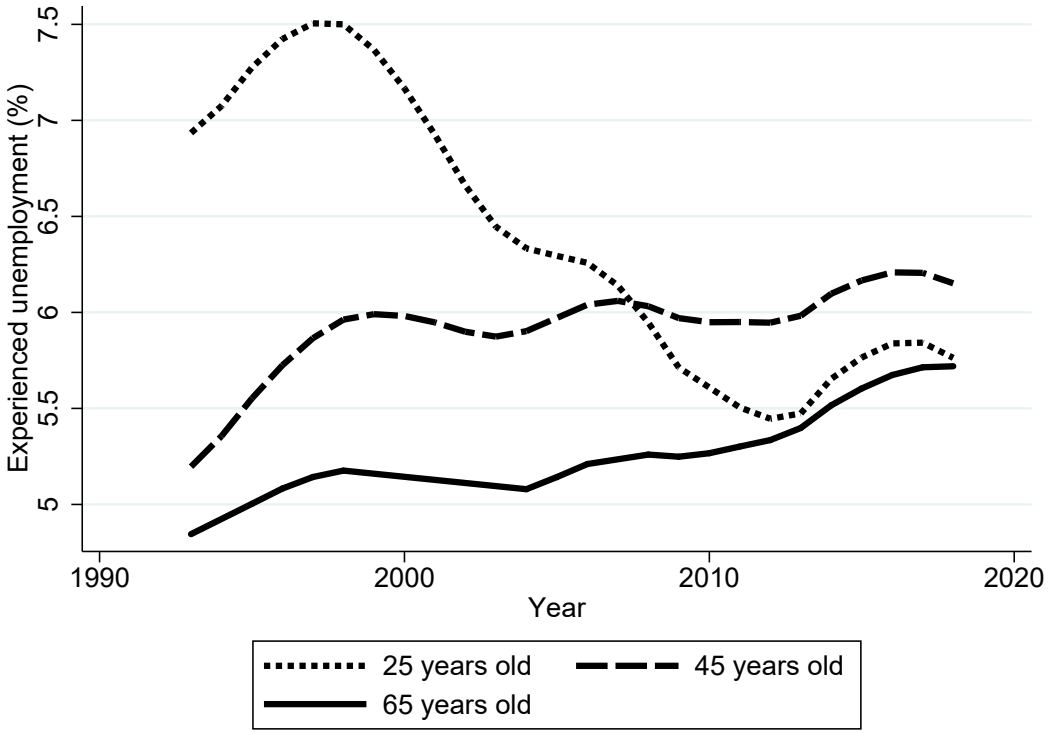
rate in the Netherlands over the period 1910-2018, which is constructed by Statistics Netherlands and shown in Figure 1.

The measure of unemployment experience ranges from 4.7 % to 7.5%, with a mean of 5.9%. Figure 2 shows the evolution of this measure for three age groups. In 2005, a 25-year old has experienced 6.3% aggregate unemployment over his lifetime, whereas a 65-year old in the same year has experienced 5.1%. Ten years later, in 2015, however, the experience of these two groups is much closer. A 25-year old has experienced 5.8% unemployment, whereas a 65-year old in 2015 has experienced 5.6%. The 45-year-old experienced lower unemployment than the 25-year-old until 2008 but higher experienced unemployment afterwards.

3 Results

We estimate the effect of unemployment experience on the saving rate, consumer credit, and labor supply in section 3.1, on the saving motives in section 3.2, and on

Figure 2: Evolution of experienced unemployment for different age groups



various preferences and expectations in section 3.3. We estimate the following equation:

$$Y_{it} = \alpha + \beta E_{it} + \gamma X_{it} + \eta_t + \epsilon_{it}, \tag{1}$$

where Y_{it} is the outcome of interest (saving rate, consumer credit, labor supply, saving motives, expectations, or preferences), E_{it} is unemployment experience, X_{it} a vector of control variables (income, assets, liabilities, age, age square, education, family size, gender, marital status, level of urbanization, whether households have children, and whether they are part of the high income panel), and η_t are year dummies. We estimate this relationship using OLS and cluster the standard errors at the individual level.

3.1 Demand and Supply

This section studies the effect of unemployment experience on the saving rate, consumer credit, and hours worked.

Saving rate. *About how much money has your household put aside in the past 12 months? Less than 1,500 EUR; between 1,500 EUR and 5,000 EUR; between 5,000 EUR and 12,500 EUR; between 12,500 EUR and 20,000 EUR; between 20,000 EUR and 37,500 EUR; between 37,500 EUR and 75,000 EUR; 75,000 EUR or more.* We then construct a measure of savings by taking the middle point of each category. For example, if a household reports savings between 5,000 EUR and 12,500 EUR, we set savings to 8,750 EUR. If a household reports savings higher than 75,000 EUR, we set savings to 75,000 EUR. To compute the saving rate, we take the ratio between savings and the reported net income in the previous year. We exclude the observations with a saving rate higher than 0.9 (less than 1% of the observations) to deal with outliers.[1]

Consumer Credit to Income Ratio. We compute the ratio of household's outstanding consumer credit at the end of the previous year to the reported net yearly income in the previous year. Consumer credit consists of private loan, extended lines of credit, credit card debts, finance debts, loans from family or friends, and study loans. Extended lines of credit accounts for nearly half of the total consumer credit. We exclude the top 1% of the distribution to deal with outliers.

Hours worked. *How many hours per week do/did you on average spend on your job?* We exclude the respondents who worked less than 12 hours and those who worked more than 60 hours (less than 1% of the observations) to deal with outliers.

Table 2 gives summary statistics for these variables. The mean saving rate is 12%, the mean consumer credit-to-income ratio is 14%, and the mean hours worked are 40. The mean saving rate increases to 14% if we exclude the 24% of respondents who do not save anything. The credit ratio increases to 55% if we exclude the 75% of respondents who do not use consumer credit. Finally, workers who work more than 40 hours per week represent about two-thirds of the respondents.

[1]The currency of the Netherlands was the Guilder before it switched to the Euro in 2002. The survey used the following categories for savings until that year: less than 3,000, between 3,000 and 25,000, between 25,000 and 40,000, between 40,000 and 75,000, between 75,000 and 150,000, more than 150,000. These categories roughly correspond to the categories in EUR. The procedure to compute the saving rate is unchanged.

Table 2: Summary Statistics - Saving, Consumer Credit, and Hours Worked

Variable	Mean	Std. Dev.	Min.	Max.	N
Saving Rate	0.122	0.136	0	0.9	13139
Consumer Credit to Income Ratio	0.141	0.467	0	6.5	15235
Hours Worked	40.495	8.103	12	60	22478
Saving Rate (Savers)	0.16	0.135	0.01	0.9	10033
Consumer Credit to Income Ratio (Borrowers)	0.551	0.791	0	6.5	3910
Hours Worked (Part-time Employees)	33.187	5.695	12	39	8460
Hours Worked (Full-time Employees)	44.905	5.833	40	60	14018

We first estimate Equation 1 to study the effect of unemployment experience on the saving rate and consumer credit. We also study the effect of experience on the saving rate of savers only and on consumer credit of borrowers only. Table 3 shows the results. Unemployment experience has a significantly positive effect on the saving rate and a significantly negative effect on consumer credit. The effects are sizable. Individuals who have experienced 1 more percent unemployment over their lifetime have a 1.5 percentage points higher saving rate, which corresponds to a 13% increase for the average saver. Furthermore, experiencing one more percent unemployment leads to a 10 percent point decrease in the consumer credit ratio, a 69% decrease for the average respondent. Note that this latter result is almost unchanged if we further exclude the 5% (instead of 1%) most indebted consumers. Column 3 studies the effect of experience on the saving rate of respondents with a strictly positive saving rate. The coefficient on experience becomes even larger and more significant. Savers who experienced one percent more unemployment increase their saving rate by 2.6 percent points, a 16% increase for the average saver. Column 4 studies the effect of experience on consumer credit for borrowers only. Borrowers who experienced one percent more unemployment decrease their credit ratio by 15 percent points, a 27% decrease for the average borrower.

We then estimate Equation 1 to study the effect of unemployment experience on weekly hours worked. We also study the effect of experience on hours worked separately for workers who more or less than 40 hours. Table 4 shows the results. Unemployment experience has a significantly negative effect on hours worked. The effects are sizable. Individuals who have experienced 1 more percent unemployment over their lifetime work

Table 3: Effects of Macroeconomic Experience on Saving and Consumer Credit

	(1) Saving Rate (Everyone)	(2) Consumer Credit to Income Ratio (Everyone)	(3) Saving Rate (Savers)	(4) Consumer Credit to Income Ratio (Borrowers)
Unemployment Experience	0.0150**	-0.0973***	0.0263***	-0.153***
	(2.12)	(-3.96)	(3.45)	(-2.58)
R^2	0.078	0.091	0.098	0.192
N individuals	4359	4954	3659	1882
N observations	12881	15068	9836	3867

t-statistics in parentheses. Control variables are log of income, log of total assets, log of total liabilities, age, age square, education, family size, gender, marital status, level of urbanization, whether households have children, whether they are part of the high income panel, and year fixed effects. Sample period: 1993-2018. Standard errors are clustered at the individual level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

1.1 hours less per week, a 3% decrease for the average worker. This effect seems to be driven by full-time workers. The coefficient remains significantly negative for full-time workers but becomes insignificant for part-time workers.

Table 4: Effects of Macroeconomic Experience on Hours Worked

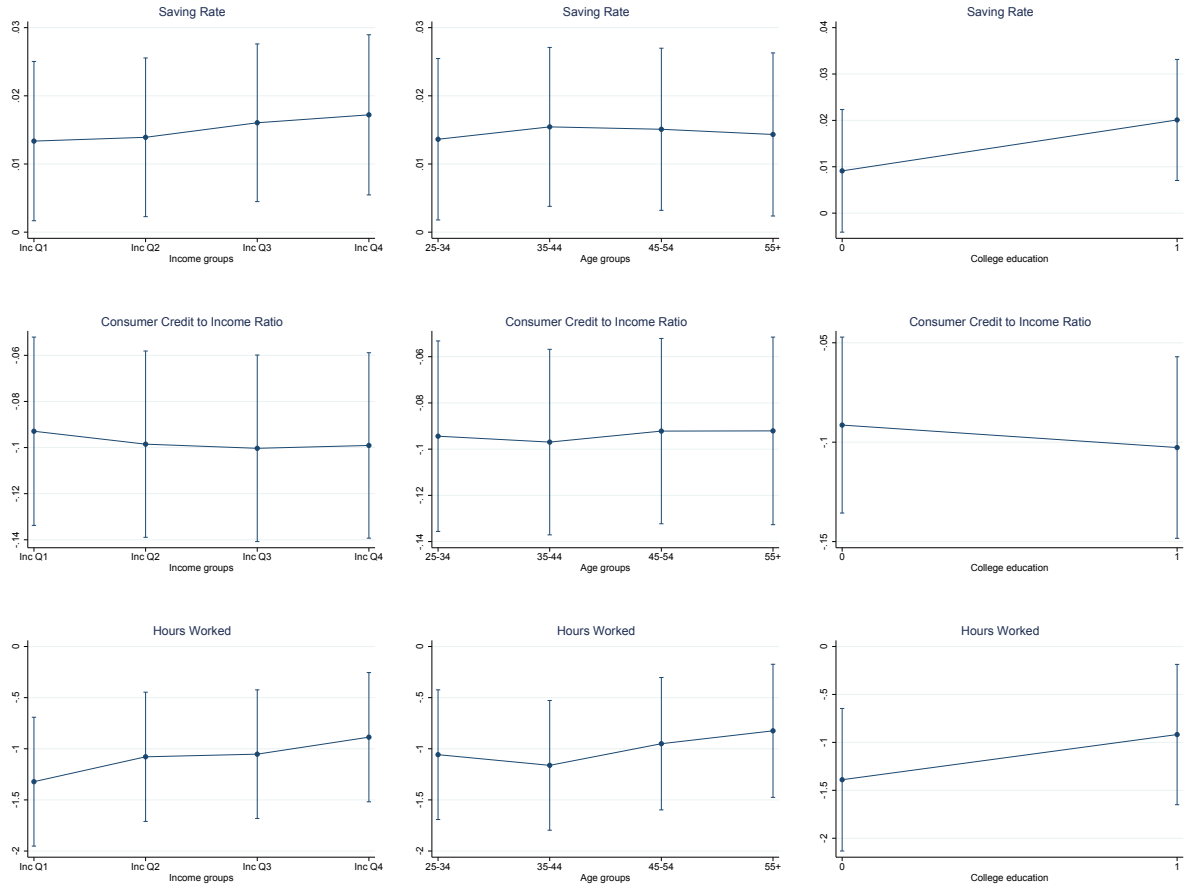
	(1) Hours Worked (Everyone)	(2) Hours Worked (<40 Hours)	(3) Hours Worked (≥40 Hours)
Unemployment Experience	-1.145***	0.603	-0.726**
	(-2.99)	(1.37)	(-2.12)
R^2	0.168	0.132	0.079
N individuals	4888	2241	3505
N observations	14941	5740	9201

t-statistics in parentheses. Control variables are log of income, log of total assets, log of total liabilities, age, age square, education, family size, gender, marital status, level of urbanization, whether households have children, whether they are part of the high income panel, and year fixed effects. Sample period: 1993-2018. Standard errors are clustered at the individual level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Next, we study whether the effect of experienced unemployment on the saving rate on labor supply depends on income, age, and education. To facilitate the exposition, we created four age groups: 25-34 years old, 35-44, 45-54, and 55+; four income quartiles; and two education groups: with and without college degree. We then ran the same specification as Equation 1 but added an interaction between experienced unemployment and each income, age, and education category, separately. Figure 3 shows the marginal

effects of experienced unemployment across income, age, and education groups on the saving rate, consumer credit, and hours worked. Although the effect of experience on economic behavior slightly differs across these categories, none of these differences are significant, suggesting that the effect of experience on economic behavior is not driven by a specific group.

Figure 3: Marginal Effects of Experience across Income, Age, and Education - 90% CI



To summarize, this section suggests that households who experienced more unemployment over their lifetime save more, borrow less, and work less. The following sections investigate more closely the possible mechanisms behind these effects.

3.2 Saving Motives

In this section, we explore why individuals who experienced tougher economic times save more by studying the relationship between unemployment experience and six saving

motives.

How important is it to you to have some money saved to... (1 very unimportant, 7 very important)

1. ... cover unforeseen expenses? **(Precautionary motive)**
2. ... to supplement your general old-age pension? **(Pension motive)**
3. ... to have some money saved so you can buy a (different) apartment or house in the future. **(House motive)**
4. ... to have some money saved to set up your own business? **(Business motive)**
5. ... to save so I can leave money to my children (or other relatives)? **(Bequest motive)**
6. ... to have some money saved to generate income from interests or dividends? **(Returns motive)**

Table 5 gives summary statistics for these six variables.

Table 5: Summary Statistics - Saving Motives

Variable	**Mean**	**Std. Dev.**	**Min.**	**Max.**	**N**
Precautionary	5.521	1.327	1	7	18375
Pension	3.94	2.04	1	7	18111
House	3.111	1.933	1	7	17746
Business	2.554	1.784	1	7	17123
Bequest	2.785	1.823	1	7	17369
Returns	3.114	1.701	1	7	17955

We then estimate Equation 1 to study the effect of unemployment experience on these different saving motives. Table 5 shows the results. Individuals who experienced higher unemployment find it more important to save to cover unexpected expenses, to supplement their pension, or to start a business. Furthermore, they find it less important to leave a bequest or to enjoy financial returns. Finally, experience does not significantly affect the motivation to save to buy a house.

Table 6: Effects of Macroeconomic Experience on Saving Motives

	(1) Precautionary	(2) Pension	(3) House	(4) Business	(5) Bequest	(6) Return
Unemployment Experience	0.168*** (2.68)	1.367*** (15.41)	-0.0700 (-0.80)	0.542*** (5.89)	-0.570*** (-5.84)	-0.220** (-2.40)
R^2	0.065	0.331	0.194	0.129	0.132	0.037
N individuals	4464	4425	4393	4294	4304	4404
N observations	13484	13302	13009	12496	12666	13181

t-statistics in parentheses. Control variables are log of income, log of total assets, log of total liabilities, age, age square, education, family size, gender, marital status, level of urbanization, whether households have children, whether they are part of the high income panel, and year fixed effects. Sample period: 1993-2018. Standard errors are clustered at the individual level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Overall, the results in this section suggests that living through tougher economic times changes the priorities of individuals when it comes to savings. In particular, saving for pension becomes very important, as shown by the very high t-statistic of 15. These results suggest that the effect of experience on the saving rate is mostly explained by a greater desire to save for pension. A greater desire to save to cover unexpected expenses and to start a business may also contribute to a higher saving rate, although to a smaller extent. Finally, these forces are sufficiently strong to overcome other forces that go in the opposite direction, such as the lower desire to save to leave a bequest or accumulate financial returns.

3.3 Expectations and Preferences

This section studies the effect of unemployment experience on the following measures of expectations and preferences:

Expected Income Growth. *What do you expect to be the highest (lowest) total net yearly income your household may realize in the next 12 months?* We average these two measures to obtain an estimate of expected income, then compute the expected percentage change with the reported net yearly income of the past year. We exclude those whose expect their income to grow by more than 300% to deal with outliers (about 2% of the sample).

Expected Income Spread. *What do you expect to be the highest (lowest) total net yearly income your household may realize in the next 12 months?* We define the expected income spread as the ratio of the difference between these two measures to their average.

Expected Job Loss. *Do you expect the total net yearly income of your household to change in the next 12 months because a member of your household who currently has a job, will stop working? 1 Yes, 0 No.*

Discount rate. *With everything I do, I am only concerned about the immediate consequences (say a period of a couple of days or weeks). 1 means extremely uncharacteristic, 7 extremely characteristic.*

Job satisfaction. *How satisfied are you all in all with your current work? 1 very satisfied, 5 very dissatisfied.* This question has only been asked since 2004 versus 1993 for the other questions.

Table 7 gives summary statistics for these variables. We expect these variables to affect savings and labor supply in the following way. Respondents with a lower expected income or who are less concerned about losing their job may save less. Furthermore, a more uncertain income and a lower discount rate may also increase. Finally, individuals who dislike their job more should work less. Savings and labor supply may be affected by these measures through yet other channels for which theory offers less clear guidance.

Table 7: Summary Statistics - Expectations and Preferences

Variable	Mean	Std. Dev.	Min.	Max.	N
Expected Income Growth (%)	-20.944	46.4	-100	300	13915
Expected Income Spread	0.253	0.34	0	2	16283
Lose Job	0.049		0	1	18670
Discount Rate	3.621	1.529	1	7	14658
Job Satisfaction	4.002	0.79	1	5	10064

We then estimate Equation 1 to study the effect of unemployment experience on these different variables. Table 8 shows the results. Respondents with higher unemployment

experience are more pessimistic. They indeed expect their income to grow slower, although the result is insignificant, and they are more worried about losing their job. This greater pessimism may play a role in explaining the higher saving rate. Income uncertainty is not significantly affected by unemployment experience and is thus unlikely to explain the higher saving rate. Greater pessimism could also explain why respondents work less if they believe that they are going to lose their job no matter how hard they work.

Furthermore, unemployment experience does not significantly affect time preferences. The absence of effect on time preferences echoes the findings of the last section, in which we showed that unemployment experience strengthened some saving motives and weakened others. To the extent that these changes in saving motives reflect changes in time preferences, these may be domain specific and would not be captured by the generic question we use. However, it is also possible that individuals who experienced more unemployment find it more important to save for their retirement for reasons that have nothing to do with time preferences. Perhaps, these individuals are simply less optimistic about how much they will earn during retirement, which would reflect an expectation rather than a preference channel.

Finally, respondents who experienced more unemployment are less satisfied with their job. They would then prefer to work less, which could explain our earlier results on labor supply.

Overall, the results in this section shed light on the potential mechanisms that may explain the effect of unemployment experience on the saving rate, consumer credit, and labor supply. A higher saving rate could be explained by more pessimistic expectations about future employment prospects. The lower labor supply may be explained by a greater aversion to work. However, future research should further examine these conjectures.

Table 8: Effects of Macroeconomic Experience on Expectations and Preferences

	(1) Exp. Inc. Growth	(2) Exp. Inc. Spread	(3) Job Loss	(4) Discount Rate	(5) Job Satisfaction
Unemployment Experience	-1.388	-0.00644	0.0219**	0.0786	-0.142*
	(-0.78)	(-2.57)	(2.46)	(0.91)	(-1.84)
R^2	0.210	0.036	0.036	0.042	0.018
N individuals	4475	4477	4667	3646	2478
N observations	13527	13634	14272	10949	8228

t-statistics in parentheses. Control variables are log of income, log of total assets, log of total liabilities, age, age square, education, family size, gender, marital status, level of urbanization, whether households have children, whether they are part of the high income panel, and year fixed effects. Sample period: 1993-2018 (Model 1-3); 1996-2018 (Model 4); 2004-2018 (Model 5). Standard errors are clustered at the individual level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

4 Robustness

This section examines the robustness of our main results. First, we use different weights to construct unemployment experience. Second, we use two alternative measures of experience: GDP growth experience and a dummy variable indicating whether the respondent lived in a recession during his impressionable years (age 18-24).

4.1 Alternative Weights and Experience Measures

The first two rows of Tables 9-11 study the effects of unemployment experience using the weights $\lambda = .5$ and $\lambda = 1.5$ instead of $\lambda = 1$ in the main specification. A higher value of λ means that events that were experienced a longer time ago receive a smaller weight.

Using $\lambda = 1.5$, the size and significance of the different effects of unemployment experience remain similar. Using $\lambda = .5$, however, the effect of unemployment experience on the saving rate is halved and loses its significance. The effect on consumer credit and hours worked remain significant and similar in magnitude. Finally, we observe some changes to the effects on preferences. Unemployment experience now significantly increases the discount rate. The effect, however, is small (a 1% increase in unemployment experience leads to an increase of 10% of a standard deviation in the discount rate) and only significant at the 10% level. Finally, the effect on job satisfaction remains positive

but loses its significance.

The last two rows of tables 9-11 use alternative measures of experience. First, we use the GDP growth experienced over the lifetime of respondents, using the same formula as with the unemployment rate with $\lambda = 1$ but with real per capita GDP growth as input (source: Statistics Netherlands). The results are consistent with those of unemployment experience. Experiencing one more percent GDP growth leads to a 7 percent point reduction in the saving rate and a 5 hour increase in hours worked. The effect on consumer credit is insignificant. The effect of GDP experience on the pension saving motive is still significant and consistent with the effect of unemployment experience. The effect of GDP experience on the other saving motives generally become less significant or even insignificant. However, the effect on saving to buy a house becomes significant.

Second, we use a dummy variable measuring whether respondents grew up during the two most severe recessions in the past century in the Netherlands (1932-1940 and 1983-1984) that are characterized by unemployment rates above 10%. More specifically, this variable is equal to 1 if respondents experienced these recessions during their impressionable years (age 18-24). Overall, the effects of impressionable years are broadly consistent with the effects of unemployment experience, although the significance levels drop even further than with GDP experience.

Table 9: Effects of Macroeconomic Experience on Saving, Consumer Credit, and Hours Worked

	(1) Saving Rate	(2) Consumer Credit to Income Ratio	(3) Hours Worked
Unemployment Exp. ($\lambda = +1.5$)	0.0176***	-0.0827***	-1.232***
	(2.68)	(-3.71)	(-3.26)
R^2	0.078	0.091	0.169
Unemployment Exp. ($\lambda = +0.5$)	0.00725	-0.105***	-0.945**
	(0.91)	(-3.58)	(-2.22)
R^2	0.077	0.091	0.168
Impressionable Years	0.00715	-0.00334	-0.137
	(1.40)	(-0.26)	(-0.46)
R^2	0.078	0.089	0.167
GDP Growth Experience ($\lambda = +1$)	-0.0711**	0.0353	5.395***
	(-2.44)	(0.38)	(3.08)
R^2	0.078	0.089	0.168
N individuals	4359	4954	4888
N observations	12881	15068	14941

t-statistics in parentheses. Control variables are log of income, log of total assets, log of total liabilities, age, age square, education, family size, gender, marital status, level of urbanization, whether households have children, whether they are part of the high income panel, and year fixed effects. Sample period: 1993-2018. Standard errors are clustered at the individual level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 10: Effects of Macroeconomic Experience on Saving Motives

	(1) Precautionary	(2) Pension	(3) House	(4) Business	(5) Bequest	(6) Return
Unemployment Exp.	0.129**	1.378***	-0.104	0.469***	-0.510***	-0.224**
($\lambda = +1.5$)	(2.08)	(16.12)	(-1.20)	(5.36)	(-5.54)	(-2.51)
R^2	0.065	0.334	0.194	0.129	0.131	0.037
Unemployment Exp.	0.204***	1.039***	0.0419	0.573***	-0.509***	-0.147
($\lambda = +0.5$)	(3.12)	(10.58)	(0.45)	(5.60)	(-4.67)	(-1.47)
R^2	0.065	0.317	0.194	0.129	0.130	0.036
Impressionable Years	-0.0617	0.401***	0.00246	0.170***	-0.183***	-0.0398
	(-1.41)	(6.74)	(0.04)	(2.81)	(-2.66)	(-0.60)
R^2	0.065	0.312	0.194	0.125	0.128	0.036
GDP Growth Exp.	0.0536	-1.848***	-0.849**	-1.828***	-0.0542	-0.298
($\lambda = +1$)	(0.21)	(-4.44)	(-2.14)	(-4.72)	(-0.14)	(-0.73)
R^2	0.064	0.307	0.194	0.127	0.126	0.036
N individuals	4464	4425	4393	4294	4304	4404
N observations	13484	13302	13009	12496	12666	13181

t-statistics in parentheses. Control variables are log of income, log of total assets, log of total liabilities, age, age square, education, family size, gender, marital status, level of urbanization, whether households have children, whether they are part of the high income panel, and year fixed effects. Sample period: 1993-2018. Standard errors are clustered at the individual level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 11: Effects of Macroeconomic Experience on Expectations and Preferences

	(1) Exp. Inc. Growth	(2) Exp. Inc. Spread	(3) Job Loss	(4) Discount Rate	(5) Job Satisfaction
Unemployment Exp.	-0.838	-0.0123	0.0151*	0.0133	-0.223**
($\lambda = +1.5$)	(-0.48)	(-0.90)	(1.67)	(0.15)	(-2.04)
R^2	0.210	0.036	0.035	0.042	0.018
Unemployment Exp.	-2.283	0.00651	0.0365***	0.180**	-0.0845
($\lambda = +0.5$)	(-1.16)	(0.40)	(3.88)	(2.10)	(-1.41)
R^2	0.210	0.036	0.036	0.043	0.018
Impressionable	-0.448	-0.00551	0.0103*	-0.0795	-0.0302
Years	(-0.36)	(-0.52)	(1.86)	(-1.27)	(-0.68)
R^2	0.210	0.036	0.035	0.043	0.018
GDP Growth Exp.	-3.847	-0.111	-0.218***	-0.557	-0.0981
($\lambda = +1$)	(-0.46)	(-1.62)	(-5.36)	(-1.27)	(-0.34)
R^2	0.210	0.036	0.038	0.043	0.017
N individuals	4475	4477	4667	3646	2478
N observations	13527	13634	14272	10949	8228

t-statistics in parentheses. Control variables are log of income, log of total assets, log of total liabilities, age, age square, education, family size, gender, marital status, level of urbanization, whether households have children, whether they are part of the high income panel, and year fixed effects. Sample period: 1993-2018 (Model 1-3); 1996-2018 (Model 4); 2004-2018 (Model 5). Standard errors are clustered at the individual level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

4.2 LISS survey

We use the LISS Dutch household survey to perform additional robustness checks. The survey is conducted by a research institute at Tilburg university and contains similar questions as DHS. However, the survey started later (2009 vs 1993) and thus features less variation in unemployment experience. First, we use questions about expected financial situation, expected job loss, hours worked, age at which the respondent would like to stop working, and job satisfaction.

Expected income. *How do you think the financial situation of your household will develop over the coming 12 months? (-2 Clearly get worse; -1 get a bit worse; 0 stay the same; 1 get a bit better; 2 clearly get better; - I don't know.)*

Age stop working. *If you were able to choose for yourself, at which age would you like to stop working?*

Hours worked. *How many hours per week do you work on average?* As above, we only keep employed respondents who work between 12 and 60 hours.

Job satisfaction. *How satisfied are you with your current work? (0 not at all satisfied - 10 fully satisfied)*

The survey does not ask about savings but asks about consumption. Since we found that respondents who experienced more unemployment have a higher saving rate, we expect that they also cut their consumption. We use two series of questions on consumption for 6 different goods. The first series asks about realized consumption over the past year while the second series asks about planned consumption over the next year.

Realized consumption. *In the past 12 months (calculated back from today), did you or someone in your household... (yes; no)*

- *buy a house or have a house built?*
- *buy a new car (not second-hand or used)?*

- *buy new big appliances, such as a washing machine or television?*
- *buy new big interior objects, such as furniture?*
- *take a long holiday (more than eight days consecutively)?*
- *take a short holiday (two to seven days consecutively)?*

Planned consumption. *We now ask you to estimate, as well as you can, the chance that you will do one of these things in the future, in terms of a percentage between 0 and 100 percent. For example, if you are fully convinced that you will do one of these things, then you answer with 100 percent. If, on the other hand, there is a small chance that you might not do it, then you answer with 97 percent or less. If you are fully convinced that you will not do one of these things, then you indicate 0 percent. But if there is a small chance that you might do it, then you indicate 3 percent or more. And if you think that the chance is actually just as good as not, then you answer with 50 percent, or slightly more or slightly less if that seems more appropriate to how you feel. How much chance is there that you or someone in your household will, in the coming 12 months...* (same goods as realized consumption)

Table 12 gives summary statistics for these variables.

We can now study the effect of unemployment experience on the first five variables. Table 13 shows the results. Respondents who have experienced more unemployment are more pessimistic about their future financial situation. Consistently, they are more likely to believe they will lose their job, although the effect is not significant. Consistent with our main results, these respondents also work fewer hours. The coefficient is larger. Individuals who experienced one more percent unemployment work about 2 hours less. These respondents also would like to stop working 5 years earlier. The effect on job satisfaction is insignificant, unlike in our main specification.

We now study the effect of unemployment experience on both realized and planned consumption. Tables 13 and 14 show the results. All the coefficients are negative, although not all significant. Overall, these results are consistent with our results on the

Table 12: Summary Statistics (LISS)

Variable	Mean	Std. Dev.	Min.	Max.	N
Expected Financial Situation	2.824	0.835	1	5	16431
Expected Job Loss	17.086	24.679	0	100	15711
Hours Worked	34.599	9.388	12	59	22180
Age Stop Working	61.847	3.133	51	75	10408
Job Satisfaction	7.381	1.522	0	10	24797
Realized consumption					
House	0.056		0	1	16844
Car	0.091		0	1	16844
Appliance	0.255		0	1	16844
Furniture	0.202		0	1	16844
Short Holiday	0.577		0	1	14140
Long Holiday	0.678		0	1	14140
Planned consumption					
House	5.622	18.654	0	100	16839
Car Expectation	7.115	18.484	0	100	16839
Appliance Expectation	20.206	26.569	0	100	16839
Furniture Expectation	18.213	27.685	0	100	16839
Short Holiday Expectation	60.346	41.851	0	100	14135
Long Holiday Expectation	64.054	38.473	0	100	14135

Table 13: Effects of Macroeconomic Experience on Expectation and Labor Supply (LISS)

	(1) Expected Financial Situation	(2) Job Loss	(3) Hours Worked	(4) Age Stop Working	(5) Job Satisfaction
Unemployment Experience	-0.286*** (-2.62)	4.466 (1.23)	-2.276** (-2.36)	-5.197*** (-2.90)	0.0277 (0.17)
R^2	0.085	0.015	0.406	0.152	0.022
N individuals	3789	3650	5787	2662	5915
N observations	15481	14779	21256	9872	23331

t-statistics in parentheses. Control variables are log income, age, age square, education, family size, gender, marital status, level of urbanization, whether households have children, and year fixed effects. Sample period: 2009-2016 (Model 1-2); 2009-2018 (Model 3-5). Standard errors are clustered at the individual level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

saving rate. Individuals who experience more unemployment not only have a higher saving rate, but also consume less and plan to consume less.

Table 14: Effects of Macroeconomic Experience on Realized Consumption (LISS)

	(1) House	(2) Car	(3) Appliance	(4) Furniture	(5) Short Holiday	(6) Long Holiday
Unemployment Experience	-0.0883***	-0.0464	-0.0949*	-0.191***	-0.285***	-0.105
	(-2.96)	(-1.27)	(-1.80)	(-3.97)	(-2.91)	(-1.25)
R^2	0.022	0.009	0.015	0.018	0.077	0.054
N individuals	3819	3819	3819	3819	3449	3449
N observations	15829	15829	15829	15829	13239	13239

t-statistics in parentheses. Control variables are log income, age, age square, education, family size, gender, marital status, level of urbanization, whether households have children, and year fixed effects. Sample period: 2009-2016. Standard errors are clustered at the individual level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 15: Effects of Macroeconomic Experience on Planned Consumption (LISS)

	(1) House	(2) Car	(3) Appliance	(4) Furniture	(5) Short Holiday	(6) Long Holiday
Unemployment Experience	-1.528	-0.635	-6.380*	-8.284**	-19.96**	-21.02***
	(-0.58)	(-0.28)	(-1.85)	(-2.32)	(-2.28)	(-2.77)
R^2	0.031	0.008	0.023	0.061	0.103	0.088
N individuals	3819	3819	3819	3819	3449	3449
N observations	15824	15824	15824	15824	13234	13234

t-statistics in parentheses. Control variables are log income, age, age square, education, family size, gender, marital status, level of urbanization, whether households have children, and year fixed effects. Sample period: 2009-2016. Standard errors are clustered at the individual level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

5 Conclusion

Using a survey of Dutch households, we find that individuals who experienced higher unemployment over their lifetime save more, borrow less, and work less. We also provide evidence suggesting that these results may be explained by shifts in saving motives, preferences, and expectations. In short, respondents who lived through tougher economic

times find it more important to save for retirement and to cover unexpected expenses, are more pessimistic, and dislike their job more.

This paper is a first attempt at uncovering the implications of experience effects on business cycles and more work is needed to identify the precise channels through which these effects work. Furthermore, future theoretical work may more closely examine the possible implications of our results for business cycle models and stabilization policies.

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