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Gizem Koşar | Davide Melcangi

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Abstract

Earnings uncertainty is central to most heterogeneous-household models. Yet, there is surprisingly little evidence on how subjective uncertainty is related to consumption behavior. Using unique data from the Survey of Consumer Expectations, we show that the marginal propensity to consume (MPC) is increasing and concave in individual specific earnings growth uncertainty. In the workhorse consumption–savings model, augmented with risk heterogeneity, MPCs decline with earnings uncertainty, contrary to the empirical evidence. We pinpoint which mechanisms, central to the model, create this disconnect and show how recently proposed deviations from the full-information rational expectations framework can reconcile theory with the empirical findings.

JEL classification: D12, D84, E21
Key words: marginal propensity to consume, consumption, subjective uncertainty, heterogeneity

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Koşar: Federal Reserve Bank of New York, CESIfo (email: gizem.kosar@ny.frb.org). Melcangi: Federal Reserve Bank of New York (email: davide.melcangi@ny.frb.org). The authors thank Felix Aidala, Augustin Belin, and Sasha Thomas for excellent research assistance. For helpful comments and conversations, they also thank Orazio Attanasio, Marco Bassetto, Nicholas Bloom, Corina Boar, Jarda Borovicka, Richard Crump, Marco del Negro, Keshav Dogra, Andres Drenik, Andreas Fuster, Simon Gilchrist, Cosmin Ilut, Kieran Larkin, Chen Lian, Elena Manresa, Virgiliu Midrigan, Luigi Pistaferri, Ayşegül Şahin, Chris Tonetti, Javier Turen, Rosen Valchev, Wilbert van der Klaauw, Joe Vavra, Venky Venkateswaran, and Basit Zafar, as well as seminar participants at NY Fed, UCL, the SED 2024, UT Austin, Dartmouth, SEA 2024, SAEe 2024, NYU, Boston College, Bocconi University, and UVA.

1 Introduction

Labor income uncertainty lies at the core of most consumption models with household heterogeneity. First, it is tightly connected with households' precautionary savings; second, it is crucially tied with ex-post household heterogeneity, implying that households display different marginal propensities to consume (MPC), even in the absence of ex-ante heterogeneity.[1] The MPC and its heterogeneity are crucial for understanding the effects of fiscal and monetary policy and have received a lot of attention in the literature over the past decade (e.g., Kaplan and Violante (2014)). Despite the central role of idiosyncratic uncertainty, empirical evidence on these mechanisms remains surprisingly inconclusive, largely due to data limitations.

In this paper, we fill this gap and examine the relationship between individual-specific subjective uncertainty and the MPC, contributing to the literature in three main ways. First, we use novel and unique data on subjective expectations to empirically document that MPCs follow a hump-shaped pattern with respect to individual-level earnings growth uncertainty. The relationship is increasing for most households and robust to a wide range of controls. Second, we find that this relationship is primarily driven by variation between households. We show that much of this variation remains unexplained by observable household characteristics, suggesting a potentially important role for latent heterogeneity. Third, we show that most of our empirical findings are inconsistent with a standard incomplete markets consumption-savings model augmented with heterogeneous earnings risk. We pinpoint which mechanisms, central to the model, lie behind the disconnect with the data. Finally, we show how recently-proposed deviations from the full-information rational expectations framework can reconcile theory with the empirical findings.

Our empirical investigation is motivated by the central role of idiosyncratic uncertainty in shaping consumption decisions within the standard buffer-stock model, which has become the foundation of most macroeconomic models with household heterogeneity. Two important forces are at play in this model. On the one hand, for a given level of cash on hand, higher earnings uncertainty increases the precautionary savings motive, typically makes the consumption function more concave, and thus raises the MPC (see Carroll and Kimball (1996) for a seminal contribution). On the other hand, higher savings lead to higher wealth, which is associated with a lower MPC. This model also has implications for the relationship between the MPC and spending uncertainty. For a given level of earnings uncertainty, the MPC typically increases with spending uncertainty, since both are higher for low-wealth

[1] Without earnings uncertainty, these models generate an MPC that is either very small and identical for all households that follow the permanent income hypothesis, or equal to 1 for borrowing-constrained households.

households (Carroll (1992)). With these mechanisms in mind, we empirically examine the relationship between uncertainty and the MPC.

For our empirical analysis, we use data from the New York Fed's Survey of Consumer Expectations (SCE). The SCE has the distinct advantage of directly measuring the two objects we are interested in: subjective uncertainty and the MPC. The survey elicits respondents' density forecasts of their year-ahead growth in individual earnings and household spending, asking them to assign probabilities to different realizations of these growth rates. We use this elicited information to construct measures of individual-specific subjective uncertainty—the uncertainty each household perceives and thus the relevant factor in their decision-making.[2] Additionally, the survey also includes a direct measure of the MPC, elicited using responses to a hypothetical income shock. This approach has been widely used in the literature, in studies of "reported-preference" MPCs (e.g., Parker and Souleles (2019), Fuster, Kaplan and Zafar (2020), Coibion, Gorodnichenko and Weber (2020), Jappelli and Pistaferri (2020), and Colarieti, Mei and Stantcheva (2024)).

Since we observe individual-level MPCs and subjective uncertainty over time, we can provide novel and extensive empirical evidence on the empirical association between these two objects. The existing literature has instead typically relied on earnings risk measures computed using realized data.[3] These risk measures can be substantially greater than subjective uncertainty, as recently shown by Caplin, Gregory, Lee, Leth-Petersen and Sæverud (2023) and Wang (2023), and may not be the relevant objects for households' decision-making. Our data also include information on *spending* growth uncertainty—an object that plays an important role in buffer-stock models but is typically unobserved and difficult to even proxy (see Jappelli and Pistaferri (2000) for a discussion)—allowing us to also empirically test the implications of the model along this novel dimension.

We uncover two main empirical findings. First, the MPC is hump-shaped in earnings growth uncertainty. In particular, the MPC increases in uncertainty for most households, but it falls at high levels of uncertainty. This concave association holds both unconditionally and when controlling for household demographics, year fixed effects, expected earnings growth, and households' net liquid wealth. Second, we find a similar hump-shaped relationship between the MPC and spending growth uncertainty in the cross-section, which also remains robust to a comprehensive set of controls.

MPCs are, however, statistically unrelated to idiosyncratic uncertainty when we control

[2] For compactness, we refer to this measure simply as "uncertainty" throughout the paper.

[3] A vast literature estimates risk heterogeneity. For instance, see Meghir and Pistaferri (2004) for a seminal contribution, Meghir and Pistaferri (2011) for a broad review of the literature on earnings, consumption and life cycle choices, and Arellano, Bonhomme, De Vera, Hospido and Wei (2022) for a recent investigation on risk heterogeneity.

for household fixed effects. We confirm this finding using hypothetical scenarios where we exogenously vary the subjective uncertainty of respondents. This finding suggests a potentially important role for latent heterogeneity, which we further investigate as follows. First, we document that uncertainty is quite stable within individuals. Second, our results are not driven by specific household traits or persistent factors, such as work status, preference heterogeneity, gender, and education. In fact, household characteristics jointly explain only about 10% of the overall variation in earnings growth uncertainty, and even less for spending growth uncertainty. This suggests that much of the dispersion in uncertainty remains unexplained, or is driven by typically unmodeled household characteristics. In other words, there might exist "types" of households that differ in their perceived uncertainty.

We conduct a battery of robustness checks to validate our main results. First, since density forecasts in the SCE are all elicited in nominal terms, we control for inflation expectations, including their uncertainty. This does not materially affect our empirical correlations. Second, earnings growth uncertainty may capture only a part of the risks households face. For example, job loss is another important source of risk for workers. In our data, respondents report their perceived likelihood of job loss; we find that MPCs are also increasing and concave in this alternative uncertainty measure. Third, our findings remain unaffected when we construct uncertainty using alternative approaches designed to address measurement error concerns. Likewise, our results hold when MPCs are elicited using survey questions that define the consumption response or the income shock in alternative ways. Finally, we find that MPCs are increasing and concave in uncertainty across the wealth distribution, for different age brackets, and for different risk aversion and time preferences.

Next, we evaluate to what extent a standard heterogeneous-agent model can be consistent with our empirical findings. We use an off-the-shelf, one-asset incomplete markets model with a no-borrowing constraint, and augment this model with heterogeneous labor income risk calibrated to match the degree of uncertainty in the SCE data.[4] We find that MPCs in the model monotonically decline with earnings growth uncertainty, in stark contrast to our empirical findings. In the model, MPCs typically increase with earnings growth uncertainty at a given level of wealth. However, higher uncertainty is associated with substantially higher levels of wealth, and both the levels and the dispersion of the MPC decline as wealth increases. This latter mechanism dominates in all the quantitative exercises that we consider, implying a negative overall relationship across households. In the data, by contrast, MPCs are highly heterogeneous across the household distribution and only weakly associated with wealth. In addition, uncertainty and wealth are also only weakly correlated.

[4] Latent heterogeneity in risk is motivated by our empirical finding that uncertainty is stable within individuals and largely unexplained by household characteristics.

The model succeeds in generating an increasing and concave relationship between the MPC and spending uncertainty. At a given level of earnings risk, low-wealth households exhibit both high spending uncertainty and high MPCs. On the other hand, earnings risk also translates into spending uncertainty, resulting in the forces behind the negative association obtained for earnings. Quantitatively, however, the first channel dominates. Nevertheless, the positive correlation in the model is primarily driven by low–wealth households, whereas in the data MPCs increase with spending uncertainty even among wealthy households.

Our empirical results therefore present a challenge for the canonical consumption-savings model that is the foundation of modern heterogeneous-agent macroeconomics. In contrast to what we observe in the data, the model predicts that MPCs fall with net liquid wealth and that households perceiving higher risk accumulate a large stock of liquid wealth. Together, these two channels generate a negative gradient between the MPC and risk in the model–simulated cross–section. In the final part of the paper, we explore several variations of the baseline model to reconcile it with our empirical evidence. We show that common extensions, such as endogenous labor supply or alternative financial constraints, do not fundamentally overturn our earlier conclusions. Preference heterogeneity and life cycle patterns are also unlikely to rationalize our empirical findings; indeed we have showed that, in the data, MPCs increase with uncertainty also conditional on age and preferences.

Finally, we discuss recent theories that depart from the full–information rational–expectations framework and that have been proposed to explain empirical consumption puzzles. We advance this strand of literature by exploring how these mechanisms interact with risk heterogeneity. We show that some models, especially the one with bounded rationality by Ilut and Valchev (2023), are particularly promising. By breaking some of the aforementioned forces typical of the canonical model, these theories generate various patterns that are consistent with our empirical findings. The success of this class of models depends, however, on the parameterization: our findings underscore the need for additional empirical evidence to discipline these models.

Our paper is related to various strands of literature. Subjective expectations have been extensively studied in macroeconomics in recent years, especially in the context of inflation (see Weber, D'Acunto, Gorodnichenko and Coibion (2022) and D'Acunto, Malmendier and Weber (2023) for two comprehensive surveys). A branch of this literature uses expectations data to infer uncertainty perceived by households. Coibion, Georgarakos, Gorodnichenko, Kenny and Weber (2024), for example, show that higher macroeconomic uncertainty reduces households' spending. We instead focus on households' uncertainty towards their own idiosyncratic variables: earnings and spending. Few papers have looked at earnings uncertainty (e.g., Dominitz and Manski (1997), Koşar and Van der Klaauw (2023), Caplin et al.

(2023)), but rarely studying how it relates to spending behavior.

Our paper is thus most closely related to the few papers using subjective expectations – and related measures of uncertainty – to inform consumption-savings models. Guiso, Jappelli and Terlizzese (1992) use a measure of the subjective variance of future earnings in the Italian Survey of Household Income and Wealth to test for precautionary savings. Bertola, Guiso and Pistaferri (2005) use the same dataset to refine the estimation of an Euler equation for consumption.[5] Christelis, Georgarakos, Jappelli and van Rooij (2020) is, to the best of our knowledge, the only other paper that, like us, makes use of a direct measure of consumption uncertainty. They use data from the Netherlands to estimate an Euler equation. Our approach is different in that we empirically relate direct measures of uncertainty and the MPC, and then interpret those findings through a structural model.

As such, we also contribute to a burgeoning literature that empirically documents heterogeneity in the MPC and its drivers (see, for instance, Parker (2017), Jappelli and Pistaferri (2020), Lewis et al. (2022), Fagereng, Holm and Natvik (2021)). To the best of our knowledge, a limited set of papers have looked at the relationship between the MPC and household risk, and none focused on individual-specific subjective earnings uncertainty.[6] Luengo-Prado and Sørensen (2008) use state-level variation to relate MPCs and features of a stochastic income process, such as persistence and risk. Savoia (2024) studies the relationship between the MPC and risk when risk declines with income.

Finally, our results contribute to and inform a large literature on heterogeneous-agent macro models. A recent set of papers have studied how risk heterogeneity can be incorporated in macroeconomic models (e.g., Broer, Kramer and Mitman (2020)). In this context, we show the performance of this class of models vis-à-vis our empirical findings. Moreover, our empirical analysis suggests the importance of household traits and latent heterogeneity in consumption/savings models, as recently studied by Aguiar, Bils and Boar (2024). Lastly, our empirical findings support recent theoretical work that introduced forms of bounded rationality in consumption-savings models (e.g., Lian (2023), Ilut and Valchev (2023)).

This paper is organized as follows. In Section 2 we briefly present the key forces in the standard consumption-savings model to guide our empirical analysis. In Section 3 we present the SCE data. Section 4 discusses our main empirical results, which we then directly compare to the predictions of a quantitative model, and variations thereof, in Section 5.

[5] See Dynan (1993) for one of the early examples of a large literature estimating Euler equations.

[6] In recent work, Iao (2024) estimates how *changes* in subjective unemployment risk correlate with changes in the MPC, and studies how the MPC varies over the business cycle.

2 Conceptual framework

Before presenting the data and our empirical analysis, it is useful to discuss the key forces at play in the standard consumption-savings model, which serves as a guide for our empirical strategy.[7] The simplest way to generate heterogeneity in earnings growth uncertainty[8] in this model is to assume that households face different degrees of earnings risk. As such, for now, we assume that full information rational expectations (FIRE) holds, and thus ex–ante perceived uncertainty and ex–post realized risk coincide.[9] Higher labor income uncertainty in this model has two effects. First, at a given level of cash on hand, it *shifts* the optimal consumption function downward and typically makes it more concave, due to an increase in the precautionary motive. As a result, the MPC function (i.e., the slope of the consumption function) shifts upward. In a seminal contribution, Carroll and Kimball (1996) prove that uncertainty increases the level of MPC at a given level of wealth. Second, however, the increase in the precautionary motive as a result of higher uncertainty also increases savings. As such, households move *along* the consumption function and increase their level of wealth. Since MPCs are negatively correlated with wealth in the model, this force has the potential to overturn the first effect, thus generating a negative correlation between MPCs and uncertainty. Indeed, we show later that this is generally the case in the quantitative versions of the model that we consider. We investigate this overall relationship as the first step of our empirical analysis.

Similar forces affect the relationship between consumption growth uncertainty and the MPC, as higher earnings uncertainty results in higher spending uncertainty. However, for a given level of labor income risk, MPCs and spending uncertainty are positively related in the model (see Carroll (1992)). This is because low-wealth households exhibit high MPCs and high expected variance of consumption growth. Across households with heterogeneous earnings risk, however, this effect may be dominated by the wealth accumulation effect as discussed before. Our second empirical test thus explores the empirical relationship between MPCs and spending growth uncertainty.

After presenting the data and our empirical findings, we return to a quantitative version of the model, and directly compare the empirical evidence and model predictions.

[7] In this section, for simplicity, we abstract from factors like borrowing constraints, which may complicate the analysis. We come back to these in Section 5.

[8] Throughout the paper, both in the data and in the model, uncertainty is defined as the standard deviation of year-ahead earnings (spending) *growth rates*, conditional on realized earnings (spending). This is the case even when we just refer to earnings uncertainty, without specifying "growth".

[9] We discuss departures from this paradigm towards the end of the paper. We also assume that risk is orthogonal to household characteristics. As we show later, a large share of the variation in uncertainty in our data is not explained by household characteristics. In complementary work, Savoia (2024) explores the case in which income risk is negatively correlated with income levels.

3 Data

We use data from the New York Fed's Survey of Consumer Expectations (SCE) from 2015 to 2023 for our analysis. The SCE is a nationally representative, monthly, internet-based survey of a rotating panel[10] of approximately 1,300 household heads. The survey collects information on household heads' experiences as well as expectations about both macroeconomic aggregates (such as inflation, home price changes, U.S. unemployment) and personal outcomes (such as household income and spending growth, earnings, job turnover, credit access and household finance situation). Each month, the monthly core survey is paired with a rotating module. These modules, each fielded every four months, focus on either the labor market, credit markets, household spending, or public policy changes. In our analysis, we primarily use data from the core module and the household spending module.

One key feature of the SCE is its reliance on *density forecasts*. In addition to *point forecasts*, the survey elicits *density forecasts*, by asking for the likelihood a respondent assigns to possible different future values of a variable. In our analysis, we use these density forecasts to construct different measures of subjective, individual-specific, uncertainty. Our main measure is based on the following question on earnings growth expectations that is asked to all employed respondents, including those who are self-employed:

> *Suppose that, 12 months from now, you are working in the exact same job at the same place you currently work, and working the exact same number of hours. In your view, what would you say is the percent chance that 12 months from now your earnings on this job, before taxes and deductions, will have ...*

increased by 12% or more	______	*percent chance*
increased by 8% to 12%	______	*percent chance*
increased by 4% to 8%	______	*percent chance*
increased by 2% to 4%	______	*percent chance*
increased by 0% to 2%	______	*percent chance*
decreased by 0% to 2%	______	*percent chance*
decreased by 2% to 4%	______	*percent chance*
decreased by 4% to 8%	______	*percent chance*
decreased by 8% to 12%	______	*percent chance*
decreased by 12% or more	______	*percent chance*
Total	100	

We follow Engelberg et al. (2009) and assume that the underlying distribution for the

[10]Each month, a roughly equal number of respondents rotate in and out of the panel and respondents participate in the survey for up to twelve months.

reported bin probabilities belongs to the generalized beta family when the respondent assigns positive probability to three or more outcome intervals. We assume an isosceles triangular distribution when the respondent puts all probability mass in two adjacent intervals and a uniform distribution when the respondent puts all probability mass in one interval.[11] After fitting a density to each respondent's reported bin probabilities, we use the estimated density parameters to calculate the mean and the standard deviation of each respondent's density. The standard deviation of the density fitted to the earnings growth expectation bins is our main measure of uncertainty. To check the robustness of our results, we also repeat our analysis using the interquantile range (IQR) of each respondent's density as another uncertainty measure. Another common way the elicited density forecasts are used in the literature is to assume that the likelihood assigned to each bin represents a probability mass at the midpoints of those bins. With this assumption, we can then calculate the standard deviation of the underlying discrete distribution. This discrete approximation will be our third way of measuring subjective uncertainty.

We proceed in the same manner to construct measures of spending growth uncertainty. For these measures, we use households' year-ahead spending growth density forecasts elicited every four months in the SCE's Household Spending module.[12] This measure is typically not included in other surveys, and thus is quite unique to the SCE. As we later elaborate, it is a particularly appealing measure because it can be seen as a sufficient statistic for all risks households face.

To construct our measure of the MPC, we again use the SCE Household Spending module and focus on a question that asks respondents how they would allocate the extra income if they were to find their household with 10% more income than they currently expect.[13] The survey instrument elicits this response in two stages. First, the respondent makes a qualitative statement about the allocation:

Suppose next year you were to find your household with 10% more income than you currently expect. What would you do with the extra income?

- ❍ *Save or invest all of it*
- ❍ *Spend or donate all of it*
- ❍ *Use all of it to pay down debts*
- ❍ *Spend some and save some*
- ❍ *Spend some and use part of it to pay down debts*

[11] For further details on the density-fitting algorithm used in the SCE, see Armantier et al. (2017).

[12] The survey question is included in Appendix A.

[13] The question has been fielded as part of the SCE's Household Spending module every 4 months since August 2015. In the following sections, we also discuss different ways of eliciting MPCs.

❍ *Save some and use part of it to pay down debts*

❍ *Spend some, save some and use some to pay down debts*

In the second stage, a quantitative response is elicited as follows:[14]

Please indicate what share of the extra income you would use to ...		
Save or invest	______	*percent*
Spend or donate	______	*percent*
Pay down debts	______	*percent*
Total	100	*percent*

The monthly core module of the survey also includes detailed information on demographics. We complement these with a measure of net liquid wealth constructed using the wealth questions included in the annual SCE Housing Survey.[15] Specifically, we define net liquid wealth as the difference between liquid assets (i.e., the sum of the value of households' holdings of checking accounts, savings accounts, money market funds, certificates of deposits, government/municipal bonds or treasury bills and stocks, bonds and investment trusts) and current total outstanding non-housing debt (thus excluding liabilities such as mortgage debt, home equity loans, and lines of credit). The details of these questions can be found in Appendix A. We report summary statistics of our main variables in Table 1.

Since the year-ahead earnings growth expectations are elicited only from the employed household heads, throughout the empirical analysis we restrict our sample to employed individuals.

Before proceeding with the empirical analysis, it is instructive to discuss the validity of the sample and the empirical measures we use. First, as shown in other papers such as Fuster et al. (2020) and Koşar and Van der Klaauw (2023), statistics of households' characteristics in the SCE align well with corresponding statistics in the U.S. population. The individuals in the sample are, on average, more educated–a pattern that is observed in all online samples. Moreover, as shown in Koşar and Van der Klaauw (2023), average expected earnings growth rates as well as the perceived layoff and quit probabilities between June 2013 and December 2023 line up reasonably well with the realized earnings growth, layoff, and quit rates in the CPS and JOLTS.

Next, we discuss evidence in support of the credibility of our measures of subjective earnings growth uncertainty. In Appendix Table B.1 we show that the subjective uncertainty measure positively correlates with households' reported monthly income variability,

[14]The second stage is only asked to respondents if they did not select the first three options in the first stage.

[15]This annual module has been fielded every February since 2014, but the wealth questions were only included in the survey up until 2020.

Table 1: Summary Statistics

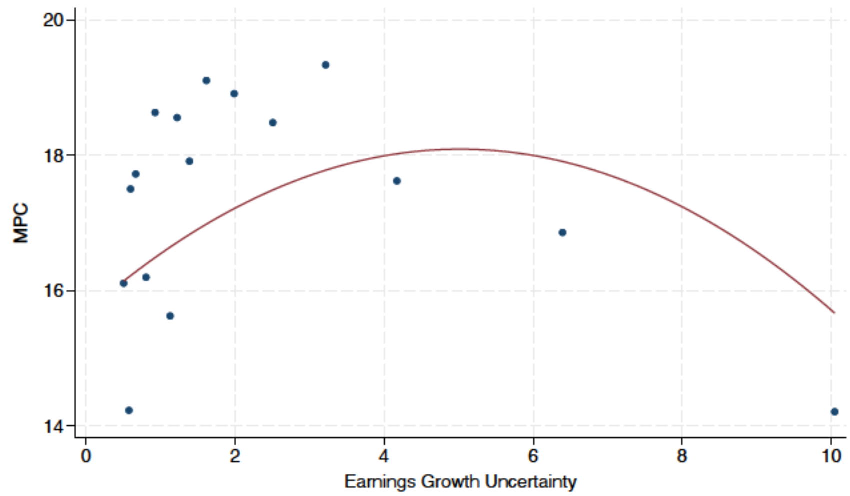
	Mean	Median	SD
Expected Earnings Growth	3.20	2.61	4.62
Earnings Growth Uncertainty	1.99	1.02	2.37
Expected Spending Growth	4.09	3.00	6.19
Spending Growth Uncertainty	2.71	1.63	2.64
MPC	16.67	10.00	21.56
% White	0.84		0.37
% Female	0.48		0.50
Married	0.67		0.47
Ages 35-50	0.45		0.50
Ages 51-65	0.31		0.46
% College Graduate	0.63		0.48
% Working PT	0.15		0.36
% Self-employed	0.10		0.30
HH Income	101,662.21	87,499.50	64,533.21
Net Liquid Wealth	87,410.25	2,750.00	251,448.28
Observations	17,312		

Note: Time period: 2015-2023. SD refers to standard deviation. Earnings (spending) growth uncertainty is measured as the standard deviation of an individual's density forecast for year-ahead earnings (spending) growth. Number of observations is for the baseline sample of Figure 1. Base groups (such as the share of the 25–34 year-olds, singles, etc.) are not reported.

which is elicited triannually in the SCE Household Spending module. Households reporting their month-to-month income to vary by more than 5% have significantly higher subjective uncertainty for their year-ahead earnings growth. As a further validation, the distribution of subjective uncertainty across households in the SCE is similar to the distribution of risk estimated by Almuzara (2020) in the PSID. In particular, most households have less than half the average uncertainty, but a significant share of households have more than twice the average uncertainty in the sample. Finally, subjective uncertainty is higher for demographics for which, in the literature, previous work has estimated higher risk using realized data. We revisit this point in Section 4.3.

Regarding the measurement of the MPC, recent literature has supported the idea that "reported" MPCs contain relevant information about the actual consumption behavior of households in response to income shocks. For instance, Parker and Souleles (2019) conclude that reported responses to tax rebates are similar to actual spending responses. Kotsogiannis and Sakellaris (2025) find close alignment between "revealed" and "reported" MPCs in Greek administrative and survey data. Shapiro and Slemrod (2003) analyze households' expected spending responses out of an upcoming tax rebate and document that the MPCs elicited this way line up with the ex-post reported MPCs elicited from retroactive questions on realized spending. Finally, Koşar et al. (2023) find that heterogeneity in MPCs out of hypothetical

Figure 1: MPC and earnings growth uncertainty



Notes. The figure shows a binned scatterplot of MPC and earnings growth uncertainty, in the SCE for the sample period 2015-2023. The solid line displays a quadratic fit. Total number of observations: 17,312.

income shocks lines up with heterogeneity in reported MPCs out of stimulus checks.

4 Empirical analysis

4.1 MPC and earnings growth uncertainty

We start our empirical investigation by plotting a binned scatterplot, in Figure 1, of the relationship between the MPC and the standard deviation of workers' expected year-ahead on-the-job earnings growth density, which we use as our baseline measure of earnings growth uncertainty.[16]

As shown in the figure, for relatively low levels of uncertainty – up to around the 80th percentile – the relationship between the MPC and earnings growth uncertainty is increasing.[17] Thereafter, however, it quickly bends and turns decreasing. The top 6% of observations with the highest levels of uncertainty has, on average, roughly the same MPC as the bottom 6%. A similar relationship holds for different measures of uncertainty, as we discuss later.

To investigate this relationship more formally, we estimate a set of regressions all nested in the following specification:

[16]In all binned scatterplots in the paper, we use 20 quantiles. Bunching in the distribution of uncertainty can result in fewer than 20 dots in the figures.

[17]Formally, there is a positive and statistically significant association between MPC and uncertainty when restricting the sample to earnings growth uncertainty below its 80th percentile.

Table 2: MPC and Earnings Growth Uncertainty

	(1)	(2)	(3)	(4)	(5)
Panel A					
Earnings Growth Uncertainty	-0.004	-0.007	-0.020	0.014	-0.229
	(0.068)	(0.070)	(0.070)	(0.137)	(0.371)
Expected Earnings Growth		0.007	0.007	-0.096	0.136
		(0.037)	(0.037)	(0.078)	(0.148)
Panel B					
Earnings Growth Uncertainty	0.797***	0.845***	0.799***	0.917***	0.165
	(0.168)	(0.180)	(0.180)	(0.334)	(0.826)
Uncertainty squared	-0.076***	-0.079***	-0.076***	-0.080***	-0.040
	(0.014)	(0.014)	(0.014)	(0.024)	(0.061)
Expected Earnings Growth		-0.034	-0.033	-0.144*	0.121
		(0.039)	(0.039)	(0.080)	(0.156)
Controls	✓	✓	✓	✓	✓
Year Dummies			✓	✓	
Net liquid wealth over income				✓	✓
Individual Fixed Effects					✓
Dep. Var. Mean	16.65	16.65	16.65	16.03	16.08
Adj. R-Squared	0.017	0.017	0.019	0.017	0.386
Observations	17,190	17,190	17,190	4,088	2,556

Note: Robust standard errors are included in parentheses and are clustered at the individual level in column 5. Time period for the sample is 2015-2023 for columns 1-3 and 2015-2020 for columns 4 and 5, due to availability of wealth variables in the data. Earnings growth uncertainty is measured as the standard deviation of an individual's density forecast for year-ahead earnings growth. The sample only includes employed individuals. Controls include log annual household income and dummy variables for having a college degree, for part-time work, self-employment, marital status, white vs non-white, gender, and age groups (25-34,35-50,51-65). Net liquid wealth over income ratio is winsorized at the 5th and 95th percentiles and available only until 2020.* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

$$\text{MPC}_{itm} = \alpha_i + \beta_1 U_{itm} + \beta_2 U_{itm}^2 + \gamma \mathbb{E}_m[\Delta w_{i,t,m+12}] + \delta_t + \Gamma X_{itm} + \epsilon_{itm} \quad (1)$$

where MPC_{itm} is the marginal propensity to consume reported by individual i in year t and month m,[18] α_i are individual fixed effects, δ_t are year dummies, $\mathbb{E}_m[\Delta w_{i,m+12}]$ is the expected year-ahead earnings growth of the individual (the density mean) and X_{itm} is a vector of time-varying individual characteristics such as demographics, income, and measures of wealth. Finally, U_{itm} is our variable of interest: subjective uncertainty or, more specifically, the standard deviation of an individual's density forecast for year-ahead earnings growth. The coefficients β_1 and β_2 measure the extent of a quadratic relationship between uncertainty and the MPC.

We report the estimates from Equation (1) in Table 2. In panel A we set $\beta_2 = 0$, while in panel B we do not impose any restrictions and estimate β_2 as well. In the first column of the table, we confirm the quadratic – and statistically significant – relationship shown in Figure 1, even after controlling for household characteristics such as income, age, race, gender, education, marital, and work status of the respondent. Focusing on these variables

[18]Note that, as mentioned in Section 3, our reported MPC measure is elicited every four months.

is motivated by the findings of Koşar and Van der Klaauw (2023), who show that earnings growth uncertainty is significantly higher for female, younger, non-white, single workers, part-time workers, self-employed, and those without a college degree.

Moving to the other columns, the relationship is little affected by controlling for respondents' expected year-ahead earnings growth and year fixed effects. Controlling for the former assuages concerns that higher uncertainty might just be statistically driven by more optimistic expectations. Including year fixed effects addresses the concern that aggregate conditions may simultaneously affect earnings uncertainty and the MPC. We find that adding year fixed effects does not materially change the estimates, in line with Koşar and Van der Klaauw (2023), who show that average earnings growth uncertainty only displayed a minor increase during the pandemic. The relationship remains increasing and concave, and statistically significant, when we control for net liquid wealth to income ratios, as we do in column (4). As discussed in Appendix A, net liquid wealth is only available until 2020 and for a subset of the respondents. Repeating the estimation of columns (1–3) with the sample of column (4) delivers similar point estimates and statistical significance. Finally, in the last column we add individual fixed effects to our regression. We observe that the relationship between the MPC and uncertainty becomes statistically insignificant when we do so. Repeating the estimation of column (5) with the sample of column (3) – thus not restricting for wealth – also delivers very similar results.

The findings of column (5), compared to the other estimates in the other columns, suggest that the relationship we uncover is primarily driven by variation between households. To further corroborate this point, we estimate a set of first-difference regressions and also find an insignificant relationship between within-individual changes in the MPC and changes in uncertainty, as we show in Appendix B.12.

MPCs and uncertainty might be insignificantly correlated within individuals simply because either the MPC, or uncertainty, or both, do not vary much within an individual's tenure in the survey. We investigate this, and how it relates to unobserved heterogeneity, in Section 4.3. In order to overcome the potential lack of statistical power, we exploit hypothetical scenarios – i.e., vignettes – where we exogenously vary the subjective uncertainty of respondents.[19] Specifically, we present households with different hypothetical scenarios that vary the degree of uncertainty about their earnings growth over the following 12 months. For each scenario, we also elicit respondents' MPCs. This exogenous variation in subjective uncertainty allows us to estimate the subjective ex-ante treatment effect of uncertainty on the MPC. In the survey, we randomized scenarios across respondents to reduce the cognitive

[19] See Fuster and Zafar (2023), Kézdi and Shapiro (2023) and Koşar and O'Dea (2023), for detailed discussions and references.

burden and considered different levels of uncertainty across various survey waves. We detail the construction of these scenarios in Appendix A and report the results in Appendix B.13. Overall, we find that the change in uncertainty is not significantly related to the MPCs, even when we allow for a nonlinear relationship. These results confirm that the increasing and concave relationship between MPC and earnings uncertainty is driven by variation between households.

4.2 MPC and spending growth uncertainty

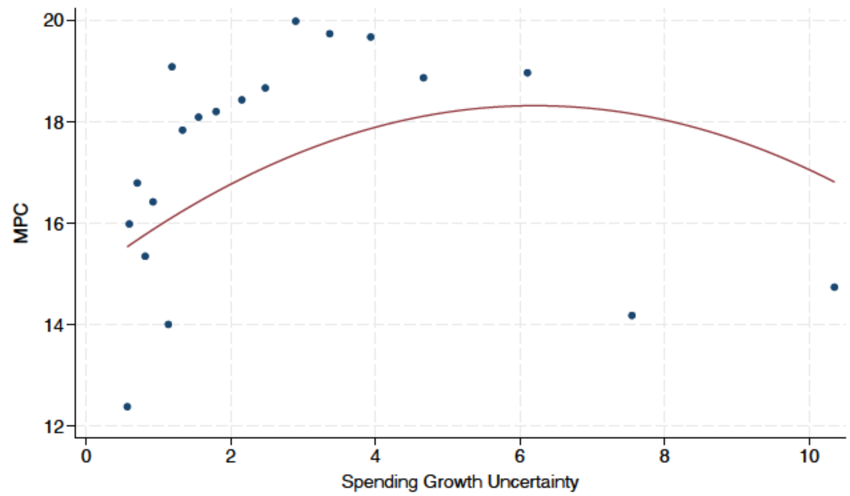
In this section we turn to spending growth uncertainty. The measure of earnings growth uncertainty we focused on in the previous section is derived from the density for expected *on-the-job earnings growth* assuming the work hours will not change, which is an incomplete measure of overall expected earnings growth. To construct a measure of workers' overall subjective labor market uncertainty would require eliciting expectations of earnings changes associated with job transitions and job loss, along with expectations of earnings changes resulting from changes in work hours even if the workers stays at the current job.[20] An alternative approach to measuring the full extent of uncertainty individuals face and perceive is to focus on the uncertainty about future spending growth, which can be seen as a sufficient statistic for all risks households face (Fagereng et al., 2017). Indeed, this measure encompasses overall uncertainty related to labor market outcomes for all members of the households, as well as the uncertainty associated with risks not specific to the labor market, such as health issues, having a child, etc.

We find that households in our sample experience a substantial degree of spending growth uncertainty, more so than earnings growth uncertainty, as presented in Table 1. Appendix Figure B.2 shows that this uncertainty co-moves positively with earnings growth uncertainty. Moreover, spending growth uncertainty is higher than earnings growth uncertainty for 62% of the observations in our sample. This result confirms that other risks, such as labor income risks unrelated to on-the-job earnings changes or risks unrelated to labor income, are also important for a large share of households.

We next show, in Figure 2, that the MPC is also hump-shaped in spending growth uncertainty. This relationship is confirmed by the regression estimates reported in Table 3. Interestingly, and different from the observed relationship between MPCs and earnings uncertainty, MPCs are statistically increasing in spending uncertainty even when we omit a quadratic term, as can be seen in panel A of the table. However, as shown in the bottom panel, the relationship is in fact concave. As we mentioned in Section 2, the buffer-stock

[20] See Caplin et al. (2023) for an effort to compute such a comprehensive measure of expected earnings growth.

Figure 2: MPC and spending growth uncertainty



Notes. The figure shows a binned scatterplot of MPC and spending growth uncertainty in the SCE, for the period 2015-2023. Total number of observations: 17,573.

model predicts that MPCs would be increasing in spending growth uncertainty for a given level of earnings risk, due to the endogenous effect of wealth. We find that our empirical estimates support this mechanism, as the estimated relationship is indeed weaker when controlling for net liquid wealth to income ratios.

The quadratic relationship between MPCs and spending uncertainty is robust to the same set of controls discussed in Section 4.1, and once again the relationship becomes statistically insignificant when we focus solely on the within-household variation. In the next section, we further investigate this result.

4.3 Uncertain types

Our results showing that the relationship between MPCs and uncertainty is quantitatively small and statistically insignificant when controlling for individual–level fixed effects may indicate that the within–person variation in MPCs and/or uncertainty within our panel is limited. This, in turn, suggests an important role for latent, possibly permanent, heterogeneity. In this section, we investigate this possibility further and look especially at potential drivers of these latent differences.

First, we explicitly assess the stability of MPCs and uncertainty in our sample. Given

Table 3: MPC and Spending Growth Uncertainty

	(1)	(2)	(3)	(4)	(5)
Panel A					
Spending Growth Uncertainty	0.222***	0.164***	0.144**	0.051	0.199
	(0.062)	(0.063)	(0.064)	(0.124)	(0.286)
Expected Spending Growth		0.107***	0.095***	0.158***	0.010
		(0.028)	(0.028)	(0.059)	(0.096)
Panel B					
Spending Growth Uncertainty	1.082***	1.204***	1.162***	0.876***	0.242
	(0.149)	(0.161)	(0.161)	(0.304)	(0.593)
Uncertainty squared	-0.078***	-0.096***	-0.094***	-0.076***	-0.004
	(0.012)	(0.013)	(0.013)	(0.024)	(0.046)
Expected Spending Growth		0.068**	0.059**	0.133**	0.010
		(0.029)	(0.029)	(0.060)	(0.096)
Controls	✓	✓	✓	✓	✓
Year Dummies			✓	✓	
Net liquid wealth over income				✓	✓
Individual Fixed Effects					✓
Dep. Var. Mean	16.66	16.67	16.67	16.01	16.06
Adj. R-Squared	0.019	0.020	0.021	0.019	0.381
Observations	17,216	17,213	17,213	4,096	2,565

Note: Robust standard errors are included in parentheses and are clustered at the individual level in column 5. Time period for the sample is 2015-2023 for columns 1-3, 2015-2020 for columns 4 and 5, due to availability of wealth variables in the data. Spending growth uncertainty is measured as the standard deviation of an individual's density forecast for year-ahead spending growth. The sample only includes employed individuals. Controls include log annual household income and dummy variables for having a college degree, part-time work status, self-employment status, marital status, white vs non-white, gender, and age groups (25-34,35-50,51-65). Net liquid wealth over income ratio is winsorized at the 5th and 95th percentiles and available only until 2020.* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

that our data set is an unbalanced panel, we consider a variance decomposition as follows:

$$\underbrace{\sum_{i=1}^{N}\sum_{t=2}^{T_i}(y_{it}-\bar{\bar{y}})^2}_{\text{overall}} = \underbrace{\sum_{i=1}^{N}\sum_{t=2}^{T_i}(y_{it}-\bar{y}_i)^2}_{\text{within}} + \underbrace{\sum_{i=1}^{N}T_i\,(\bar{y}_i-\bar{\bar{y}})^2}_{\text{between}}, \tag{2}$$

where $\bar{y}_i$ are within-individual averages and $\bar{\bar{y}}$ is the overall sample average. When we decompose the overall variation in the MPC to *within–* and *between–person* variation, we find that the within–person variation explains only 34% of the overall MPC variation in the sample, suggesting that the majority of the MPC heterogeneity we observe in our sample might have a permanent nature. However, due to observing each respondent for up to 12 months, we are unable to test formally whether individuals have permanent MPC types over their life-cycle or whether MPCs being invariant is just a short panel phenomenon.

We find that uncertainty is even more stable during a respondent's tenure in the survey. As mentioned in Section 3, the SCE elicits year-ahead subjective earnings growth uncertainty every month and subjective spending growth uncertainty every 4 months. Following the decomposition in Equation (2), we find that the within–individual variation explains only

30% of the overall variation in earnings growth uncertainty and 27% of the overall variation in spending growth uncertainty.

Next, we investigate in Appendix Table B.2 whether there are any observable characteristics that can explain these seemingly permanent differences and whether unobserved heterogeneity may have a role. To start with, in the first column, we find that earnings growth uncertainty increases with net liquid wealth and declines with household income/earnings and age. We find that the association between net liquid wealth and uncertainty is nonlinear, but weak. We come back to this discussion in the context of the structural model of Section 5. Importantly, these observable, time-varying characteristics explain very little (about 1%) of the overall variation in earnings growth uncertainty.

We then turn to other household features considered in the literature that might explain the cross-sectional variation in uncertainty. For instance, households may self-select into riskier jobs,[21] which may result in persistent differences in uncertainty. While we observe some selection into certain industries based on respondents' earnings growth uncertainty in our data, industry heterogeneity only explains a negligible fraction of the overall variation in uncertainty. Furthermore, building on work by Koşar and Van der Klaauw (2023), we find that part-time workers and/or those who are self-employed are likely to have higher uncertainty. However, all these job-related characteristics, in addition to the other time-varying respondent characteristics mentioned earlier, explain only about 3% of the overall variation in uncertainty.

Preference heterogeneity is another popular explanation for permanent differences across households. Recent work by Aguiar et al. (2024) has illustrated the role of this type of heterogeneity in consumption-savings models and for the MPC in particular. For our analysis, we construct two measures of preference heterogeneity. First, we look at risk aversion using responses to questions on willingness to take risks in daily activities. Second, we consider a measure of time preference or patience, constructed based on whether respondents think of themselves, relative to other individuals, as generally willing to give up something today in order to benefit in the future. We find that risk-averse households indeed report lower uncertainty, supporting the idea that there is some selection into risk. In addition, our results show that more impatient households are more uncertain, all else equal. Nonetheless, once again, preference heterogeneity explains a negligible share of the overall variation in uncertainty, even when we consider other demographics that might correlate with preferences and occupational choice, such as gender, education, and marital status.

In summary, our analysis shows that unobserved heterogeneity is an important driver of individual-specific uncertainty. We find that uncertainty is correlated with many observable

[21]See Lusardi (1997) for a discussion on this.

household characteristics, in sensible ways: this is reassuring in terms of the reliability of the responses in the SCE. Still, all the household characteristics discussed so far jointly explain only about 10% of the overall variation in earnings growth uncertainty, as we show in Appendix B.2.[22] This suggests that much of the dispersion in uncertainty remains unexplained, or at most driven by typically unmodeled latent household characteristics. In other words, there might exist "types" of households that differ in their perceived uncertainty. Consistent with this, in Section 5, we assume that households are permanently heterogeneous in the earnings risk they face, and test whether the structural model implies that more uncertain households have higher MPCs. Before presenting these results, we discuss in the next section the robustness of our empirical findings.

4.4 Other channels and robustness

In this section we explore other channels and mechanisms that could be important for the relationship between the MPC and uncertainty, and show robustness of our main findings. First, we discuss the role of inflation expectations. Second, we consider alternative definitions of uncertainty, including the probability of job loss and various robustness checks related to potential measurement issues. Third, we show robustness to alternative definitions of the MPC. Fourth, we discuss the role of spousal insurance and how our findings are affected by household composition. Finally, we show how our results vary by household characteristics, such as wealth and age.

Inflation expectations The density forecasts on year-ahead earnings and spending growth in the SCE are all elicited in nominal terms. To account for the role of year-ahead inflation expectations in these density forecasts, we control for the year-ahead inflation expectations elicited in a similar manner in the SCE. Our results, presented in Appendix B.3, show that controlling for year-ahead inflation expectations, and respondents' subjective uncertainty in these year-ahead inflation forecasts, in fact do not materially change the relationships we document.[23] Interestingly, inflation uncertainty is strongly correlated with both earnings growth uncertainty and spending growth uncertainty and explains about a third of their variation. When running a Lasso estimation for different levels of the regularization param-

[22]We find that most of the variation in spending growth uncertainty is also unexplained by household characteristics.

[23]Note that we cannot measure or back out subjective uncertainty in real earnings (spending) growth in our dataset. Indeed, we do not observe the subjective, individual-level, covariance between nominal earnings (spending) growth and year-ahead inflation. These objects are likely to be heterogeneous across households. Stantcheva (2024) shows that people dislike inflation because they perceive that their nominal wages do not grow at the same pace as prices, thus suggesting the covariances may be negative for most households.

eter, performing an exercise similar to the one in Boehm et al. (2025), inflation uncertainty comes up as the most important driver for earnings growth uncertainty and the second most important driver for spending growth uncertainty after expected earnings growth. With the caveat of the aforementioned measurement considerations, we see these findings as further confirming the existence of "uncertain types".

Our results are also unchanged when we control for expectations about other macroeconomic variables, such as the change in the U.S. unemployment rate or in stock prices, and households' perceptions and expectations about credit access. These results are shown in Appendix Tables B.20 and B.21.

Job loss expectations As mentioned before, one concern with our measure of earnings growth uncertainty might be that it captures only part of labor income risk, given that our measure is conditional on remaining on the same job. One additional important source of risk for workers is job loss. As an example, Carroll et al. (2003) proxies uncertainty with an estimated probability of job loss. In addition to earnings growth, spending growth, and inflation expectations, the SCE elicits workers' job loss expectations over the following 12 months. When we control for job loss expectations, our main findings are little affected, as shown in Appendix Table B.6. Moreover, we find that MPCs are also hump-shaped in the subjective probability of job loss, as we show in Appendix B.4. We also construct a measure of job loss uncertainty, which is maximized at 50% probability of job loss, to reflect respondents' uncertainty about how likely (or not) they might experience a job loss in the next 12 months, and minimized at 0 and 100% probability. Our analysis shows that MPCs are increasing and concave in this uncertainty measure, too.

Alternative definitions of subjective uncertainty So far in our analyses, we have used uncertainty measures defined as the standard deviation of individuals' density forecasts of earnings and spending growth. Nevertheless, our results are not specific to these particular definitions of uncertainty. As mentioned in Section 3, one alternative measure we construct is based on the assumption that the likelihood assigned to each bin in the density forecast represents a probability mass at the midpoints of those bins. We then calculate the standard deviation of this underlying discrete distribution. With this uncertainty measure based on a *discrete-approximation*, we find the same increasing and concave relationship between uncertainty in earnings growth and the MPC as well as between spending growth uncertainty and the MPC, with all coefficients statistically different from zero and of even larger magnitudes than in our baseline. The results are reported in Appendix Tables B.8 and B.9.

One potential concern with our uncertainty measures may be that the density forecasts are measured with error. This would be concerning, if measurement error was more severe for higher levels of uncertainty. However, if this was the case, and assuming that these errors are drawn from a distribution with a zero mean, we would expect attenuation bias to make the relationship between MPCs and uncertainty flatter for high levels of uncertainty. Our results, however, show that this is in fact not the case. To further alleviate these concerns, we perform various robustness checks on our baseline measures of uncertainty, and report all results in Appendix B.5. First, we winsorize our uncertainty measure at the top 99th percentile: regression coefficients become quantitatively larger and have lower standard errors. Second, we restrict the sample to those respondents who put zero probability on either the top or the bottom bin of the earnings (spending) growth options presented in the survey. This is motivated by the fact that most of the measurement error is likely to arise at the tails of the distribution, due to our parametric assumptions. The main results in our baseline specifications are once again confirmed in this subsample and, in fact, the regression coefficients are quantitatively larger, although we lose some statistical power when we include net liquid wealth. Finally, we consider the interquartile range of each individual's density forecast as a measure of subjective uncertainty for earnings and spending growth. By construction, this measure should be less affected by outliers and tail events. Even in this case, we find an increasing and concave relationship between MPC and earnings (spending) growth uncertainty, indicating that the results we report in our analyses are robust to differences in the construction of uncertainty measures.

Alternative definitions of the MPC Next, we consider alternative ways to elicit individuals' MPCs. First, we use questions that were fielded in various waves of the SCE Housing Survey and studied by Fuster et al. (2020). We report the survey question in Appendix A. Compared to our baseline elicitation of the MPCs, this approach differs in four ways. First, here, respondents are asked about their allocation of a specific dollar amount (e.g., $500) rather than of a share of their incomes. Second, the hypothetical payment in the question is explicitly stated to be unexpected and one-time. Third, the respondents are given an explicit time frame for the spending response (e.g., 3 months). Finally, the question elicits the allocation of this unexpected, one-time payment in comparison to the counterfactual state of the world (e.g., would you spend more than/the same as/less than if you had not received the transfer). We repeat our analysis using MPCs elicited by Fuster et al. (2020) and once again find an increasing and concave relationship between the MPC and earnings growth uncertainty, albeit statistically insignificant, but no relationship between the MPC and spending growth uncertainty. The lack of statistical power is consistent with Fuster et al. (2020), who find little systematic heterogeneity in spending responses to gains, including no relationship with income or liquid wealth.

One potential caveat with eliciting MPCs using counterfactuals is that responding to such questions might be cognitively challenging to the respondents. For this reason, in September 2023, we fielded a version of our baseline MPC question in the SCE adapted to reflect the key features of the question in Fuster et al. (2020), but without the counterfactual nature. Our new question, included in Appendix A, explicitly states that the windfall is unexpected, one–time, and specifies the decision horizon to be 3 months. Using responses to this question, we still find an increasing and concave relationship between the MPC and earnings (spending) growth uncertainty. We report these results in Appendix B.8.

Spousal Insurance A household's family structure influences both the level of risk the household members face and the amount of self-insurance they can access. Single individuals, for example, might face lower overall uncertainty and thus make their consumption decisions accordingly; at the same time, however, they can only rely only on their own savings to insure against fluctuations in income or to smooth consumption (De Nardi et al., 2024). For this reason, the relationship between the MPC and uncertainty might be different based on marital status.

To investigate whether this is indeed the case, we estimate our baseline specifications separately for single and married respondents. We find that the increasing and concave relationship between the MPC and uncertainty is present for both groups, as shown in Section B.6.

Results across the household distribution As we briefly discussed in Section 2, the standard buffer-stock model predicts that the positive relationship between MPCs and uncertainty should be stronger at a given level of wealth. In Appendix B.10, we show that MPCs are increasing and concave in earnings (spending) uncertainty for all quartiles of net liquid wealth – although statistically insignificant for some quartiles. The results for high levels of wealth are particularly interesting, as standard theory suggests that the relationship should eventually fade for wealthy households, who follow the permanent income hypothesis. We see our results as consistent with a recent strand of empirical literature that finds that MPCs are large even among wealthy households (e.g., Lewis et al. (2022), Holm et al. (2021), Graham and McDowall (2024)). We expand on these findings in the following sections.

Going back to respondent characteristics that are correlated with subjective uncertainty, we find that controlling for industry dummies in our baseline specification makes the quadratic relationship even starker (see Appendix B.7). Moreover, even though part-time workers and/or those who are self-employed are likely to have higher uncertainty, we show in Appendix Figure B.1 that the relationship between MPC and earnings growth uncertainty is still increasing and concave when we exclude both categories of workers from our sample.

In addition, preference heterogeneity does not seem to drive our results. MPCs are correlated with measures of preferences: for instance, more risk-averse households, and especially more impatient households, have higher MPCs. Subjective uncertainty is also correlated with risk aversion and patience as discussed in 4.3. Nevertheless, we show in Appendix B.9 that not only our baseline correlations between MPCs and uncertainty are broadly unaffected by controlling for preference heterogeneity, but also that MPCs are still increasing and concave even conditional on different levels of risk aversion and patience.

Finally, MPCs are increasing and concave in uncertainty even at different ages, as we show in Appendix B.11. As such, while life-cycle patterns may affect either side of the relationship, specific demographics do not seem to drive our results.

We come back to these sets of results after presenting the structural model.

5 Incomplete markets model with heterogeneous risk

In this section, we assess our empirical results through the lens of a structural model. We focus on two main questions. First, what is the unconditional relationship between MPCs and earnings growth uncertainty in a plausibly calibrated incomplete markets model? Second, what are this model's predictions for spending growth uncertainty?

Our point of departure is a standard consumption-savings incomplete markets model. The economy is populated by a continuum of infinitely lived households, with net asset holdings a and exogenous earnings y.[24] For simplicity, we assume that households can borrow and save at the same risk-free interest rate, r. As typically assumed in the literature, households face an exogenous borrowing constraint, such that $a' \geq \underline{a}$. Households consume a nondurable good c, from which they derive utility. Log labor income follows an AR(1) process, with persistence ρ and Gaussian innovations, η. In order to generate heterogeneity in the conditional variance of future earnings growth, we assume that earnings risk is heterogeneous. Hence, each household i can potentially face different earnings risk, such that innovations to the income process are normally distributed with heterogeneous variances σ_i^2.[25] This modeling choice is motivated by our empirical findings that uncertainty is stable within individuals and is mostly unexplained by observable household characteristics. The

[24] We omit time subscripts and denote next period variables with the superscript $'$. Due to risk heterogeneity, we index the household problem and its components by i.

[25] With homogeneous earnings risk, and depending on the definition, the conditional variance of earnings growth is either the same for all households – $VAR(\log y_{t+1} - \log y_t | \log y_t) = \sigma^2$ – or different across households only by the earnings level y_t – $VAR\left(\frac{y_{t+1}-y_t}{y_t}|y_t\right)$ – a case we do not deem interesting.

household problem is summarized as follows:

$$
\begin{aligned}
V_i(a_i, y_i) = \max_{c_i > 0, a_i' \geq \underline{a}} \; & u(c_i) + \beta E V_i(a_i', y_i') \\
\text{s.t.} \\
c_i + a_i' &= y_i + a_i(1+r) \\
\log y_i' &= \rho \log y_i + \eta_i
\end{aligned}
$$

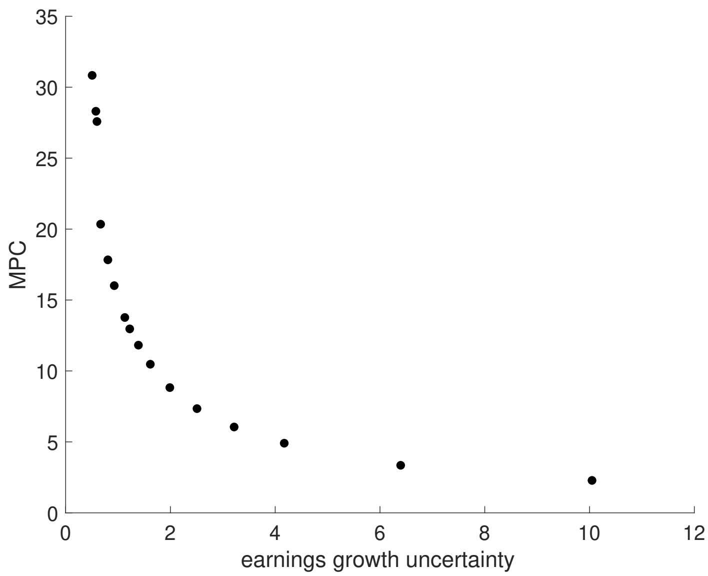
Parameterization A period is one year, to align with the horizon of expectations elicited in the SCE. As often done in this class of models, we assume a constant-elasticity utility function $u(c) = \frac{c^{1-\gamma}-1}{1-\gamma}$ and set $\gamma = 1$, so that $u(c) = \log(c)$. For simplicity, we set $\underline{a} = 0$, which implies that households cannot borrow. Note that higher uncertainty also affects the shape of the consumption function through the probability of hitting the borrowing constraint in the future. Nevertheless, we show later that a looser borrowing constraint matters only quantitatively and therefore does not affect our conclusions. We follow Kaplan and Violante (2022) and set the risk-free interest rate to 1%. We choose the discount factor, $\beta = 0.9898$, such that 14% of households are "hand-to-mouth". We set $\rho = 0.904$. As we discuss later and show in Appendix C.3, the main conclusions of this section do not depend on any of the specific parameter values we choose. Finally, we calibrate σ to the heterogeneity in subjective earnings growth uncertainty as in the SCE. We solve the model for the same 16 quantile values showed in Figure 1 and weight all our model-based results to reflect the share of SCE observations in each quantile of σ. We follow the convention in the literature and define the MPC for a household of type i with state vector (a_i, y_i) as $\frac{c_i(a_i+x, y_i) - c_i(a_i, y_i)}{x}$, where x is arbitrarily small. In Appendix C.2 we show that all of our results are qualitatively unaffected if $x = 0.1y_i$, which is a closer analog to the SCE data question. We define individual-level earnings growth uncertainty as σ_i, and spending growth uncertainty as the standard deviation of an individual's year-ahead consumption growth rate, conditional on current consumption.[26] To align the model output with the data, we report growth rates as well as MPCs in percent terms.

5.1 MPC and earnings growth uncertainty

We start by looking at the relationship between the MPC and uncertainty across all households in the stationary distribution of the model. We find that MPCs monotonically fall with

[26] Note that in this model realized risk and subjective uncertainty coincide, meaning that households are assumed to have rational expectations and full information.

Figure 3: MPC and earnings growth uncertainty in the model

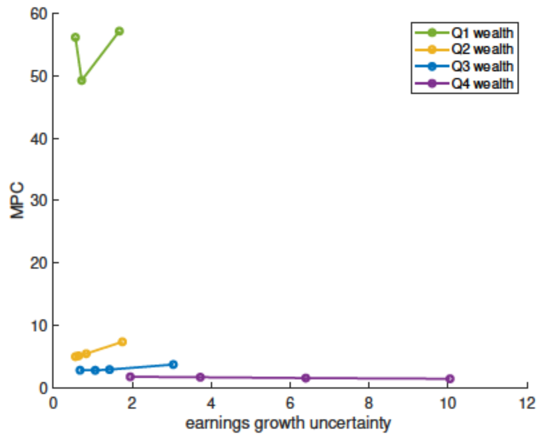


σ_i, as we show in Figure 3. We then run, in the model, the same regressions as in Table 2. MPCs remain negatively correlated with earnings growth uncertainty even when controlling for expected earnings growth, assets-to-income ratio, log of income, and a quadratic term for uncertainty. We report these results in Appendix Table C.1.

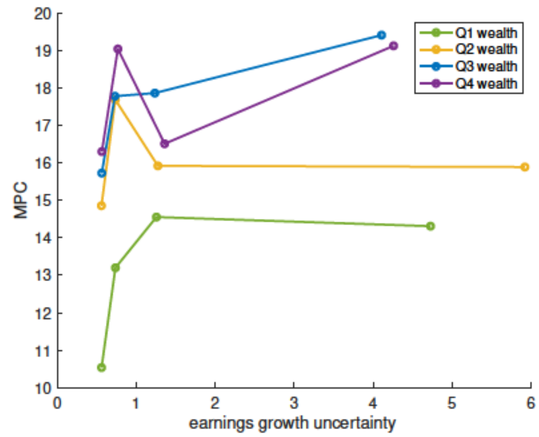
We observe that controlling for assets makes the relationship between MPCs and uncertainty slightly less negative. Indeed, the theory suggests that MPCs increase with uncertainty at a *given* level of wealth, as higher risk makes the consumption policy function more concave. However, linearly controlling for assets is not enough to make this effect stand out quantitatively.

Mechanisms Conditioning on quartiles of wealth sheds light on the forces at play in the model and why the model's predictions are at odds with the empirical evidence. As we show in Figure 4a, *within* a quartile of wealth, MPCs typically increase with earnings growth uncertainty. This is because, although wealth increases with uncertainty within each quartile, in that limited region this effect is dominated by a more concave consumption function. *Across* quartiles, however, the wealth accumulation effect dominates. Higher uncertainty is associated with much higher wealth (the curves in Figure 4a shift to the right) and higher wealth is associated with lower MPCs (the curves progressively shift down). This force implies that MPCs monotonically fall with earnings growth uncertainty in the model,

Figure 4: MPC and earnings growth uncertainty by wealth quartile



(a) Model



(b) Data

Note: Left panel shows data simulated from the stationary distribution of the model. Households are grouped in four quartiles of wealth (a), from the lowest (Q1, in green) to the highest (Q4, in purple). For each quartile of wealth, dots represent quantiles of earnings growth uncertainty. The right panel repeats the same analysis in the SCE data, grouping households by quartiles of net liquid wealth.

as we show in Figure 3.

In the data, most of these forces do not show up, as can be seen in Figure 4b. Indeed, MPCs are broadly increasing and concave in uncertainty across all quartiles of net liquid wealth; moreover, the curves are much closer to each other (both vertically and horizontally). This is due to three main reasons. First, uncertainty and wealth accumulation are much more clearly related in the model than in the data. While the curves clearly shift to the right across wealth quartiles in the model, we do not observe the same pattern in the data. Second, and most importantly, the model features a strong negative correlation between the MPC and wealth, which is not borne in the data. Indeed, the curves across quartiles shift down in the model, while they do not in the data. If anything, in the data MPCs are lowest among net debtors (the bottom quartile): Koşar et al. (2023) show that this is due to strong debt repayment motives among debt holders. Hence, even if one hardwired in the model a mechanism to limit wealth accumulation in the presence of risk, that would not be enough to align the model to the empirical evidence.

Third, in our data, there is substantial heterogeneity in the MPC even for high levels of net liquid wealth, and MPCs seem to be positively correlated with uncertainty even for those in the upper echelons of the wealth distribution. In contrast, the model's MPCs progressively collapse towards the low, permanent-income, level as wealth increases. Several recent empirical papers are consistent with our observation in the SCE that MPCs are large for wealthy households, and propose various explanations (see for instance Holm et al. (2021), Graham and McDowall (2024), Boutros (2023), and Ilut and Valchev (2023)). The main objective of these papers is to propose mechanisms, such as mental accounting or bounded rationality, by which the MPC does not converge to approximately zero as liquid wealth grows infinitely large, as instead it does in the workhorse model. To the best of our knowledge, the relationship between the MPC and risk has not been explored in those settings. We come back to this point in Section 5.3.

One concern for the discrepancy we uncover between the model and the data is that net liquid wealth may be measured with error in the data. To work around this issue, we look at how MPCs and uncertainty are related within quartiles of expected consumption growth (instead of quartiles of wealth) and report these results in Appendix Figure C.1. In the model, households that engage more forcefully in precautionary savings have higher expected consumption growth, as they have to postpone current consumption and save instead. Due to the concavity of the consumption function, this also implies that they display a higher MPC. Conditional on a certain expected consumption growth, however, MPCs always fall with earnings uncertainty.

In the data, in contrast, MPCs are once again typically increasing and concave in uncertainty for all quartiles of expected spending growth (see Appendix Figure C.1). In line with the model, MPCs are lowest for those with the lowest expected spending growth, although the ranking for the rest of the distribution is less clear than in the model. Differently from the model, however, households in the data also display sizable MPC heterogeneity, and an increasing and concave association with uncertainty. In the model, in contrast, households with low expected consumption growth are close to their target level of wealth: their consumption function becomes approximately linear, and MPCs are all close to zero.

The model results of this section are also not specific to the quantitative extent of risk heterogeneity. By calibrating risk to subjective uncertainty in the SCE, the model generates a standard deviation of earnings growth that is much less dispersed than what is measured with realized data (e.g., Guvenen et al. (2021); Caplin et al. (2023)). In other words, the extent of risk featured in our calibration is smaller than what typically used in similar models (see Wang (2023) for a discussion). Nevertheless, this affects only the steepness of the relationship between MPC and uncertainty, as can be seen in Figure 3, rather than the sign of the relationship.

Short-run dynamics Throughout this section, we have considered the model's predictions in a stationary distribution of households. This, and allowing for permanent heterogeneity in risk, is motivated by our empirical observation that the relationship between MPC and uncertainty is driven by variation across households. Nevertheless, we find that the model's predictions are also at odds with the data when we consider short-run dynamics, i.e., the predictions of the model after an unexpected change in σ.[27] In particular, following an unexpected permanent increase in σ, the average MPC typically increases upon impact, albeit modestly. Thereafter, the MPC falls over time and eventually converges to a value below the one before the shock: in other words, MPCs fall with σ in the long-run, as we have showed before in Figure 3. This implies that MPCs are *lower* in the long-run than in the short-run. This is consistent with MPCs typically increasing with σ for a given level of wealth, but declining with σ in the cross-section, as discussed before.

These patterns stand in sharp contrast with the data. We have indeed found that within-individual changes in the MPC are uncorrelated with within-individual changes in uncertainty. Most importantly, in the data, the correlation between MPC and uncertainty is *lower* within individuals than across. The hypothetical uncertainty scenarios we have discussed before and presented in Appendix B.13 confirm this pattern. Our empirical evidence shows that MPCs insignificantly decline in response to an exogenous variation in uncertainty, while they are positively and significantly correlated in the cross-section; yet, the opposite is true in the model.

5.2 MPC and spending growth uncertainty

Our second empirical fact is that MPCs are increasing and concave in spending growth uncertainty. Figure 5 shows that this pattern is, in fact, qualitatively replicated by the model. In Appendix Table C.2, we show that MPCs are increasing and concave in spending growth uncertainty, even when we control for expected spending growth and wealth-to-income ratios.[28]

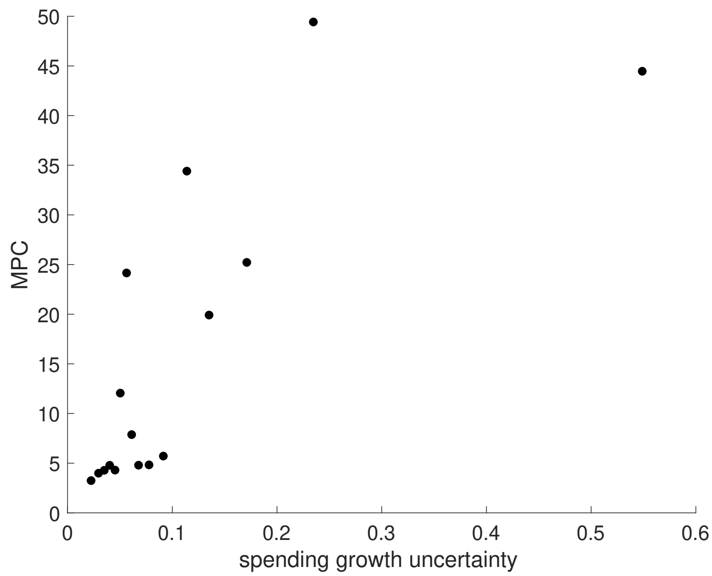
Why is the model successful in generating a positive correlation between MPCs and spending growth uncertainty, while its predictions are at odds with the data for the relationship between the MPC and earnings growth uncertainty? Similar to the analysis presented in Figure 4a, within a wealth quartile, MPCs increase with spending uncertainty (see Appendix Figure C.2).[29] Across quartiles, MPCs decline with wealth. However, different from Figure 4a, spending uncertainty is only weakly correlated with wealth. Two forces are at

[27] For this analysis, we consider a version of the model with homogeneous σ, and analyze the response to an unexpected permanent increase in σ, restricting the attention to households whose income realization is always equal to the preserved mean.

[28] The coefficient estimates in the model regressions are an order of magnitude larger than those in the regressions presented in Table 2. This is due to spending growth uncertainty generated in the model being considerably smaller than in the data.

[29] Note that the relationship between MPCs and spending growth uncertainty is much steeper for lower quantiles of wealth. This is in contrast with the data, where MPCs are large and heterogeneous even among wealthy households, as we discussed before.

Figure 5: MPC and spending growth uncertainty in the model



play. Conditional on a level of earnings risk, σ, spending growth uncertainty is higher for lower levels of wealth. As discussed in Carroll (1992), low-wealth households display high MPCs and high expected variance of consumption growth. This mechanism, by itself, sustains a positive correlation between the MPC and spending uncertainty. Across levels of σ, as discussed before, higher uncertainty is instead associated with higher wealth and lower MPCs, implying a negative correlation. In the model, the former force dominates the latter, generating the observed positive correlation in the cross-section.

One reason behind this quantitative result is that earnings risk only partially passes through spending growth uncertainty in the model. Indeed, spending growth uncertainty in the model is much smaller and less dispersed than in the data, even though we have calibrated earnings risk, σ, to match the dispersion of subjective earnings uncertainty in the data. Consumption smoothing in the model implies that spending growth uncertainty is always much smaller than its earnings growth counterpart. In the data, in contrast, spending growth uncertainty is *higher* than earnings growth uncertainty for 62% of the observations. Such a large quantitative disconnect likely suggests that households in the data are facing a large amount of risk that is not related to their labor income but yet affects their spending behavior (see, for instance, De Nardi et al. (2010) and Blundell et al. (2024) for related work).

5.3 Successes and failures of alternative models

In this section, we discuss whether any extensions of the structural model we considered thus far, or any alternative model, can generate predictions consistent with our empirical evidence. We also outline the reasons why specific model mechanisms succeed (or fail) to give rise to the empirical patterns.

Alternative parameterizations The model's implications we have presented thus far are not specific to the parameter values we choose. As we show in Appendix C.3, different degrees of risk aversion, γ; persistence of labor income, ρ; discount factor, β; interest rate, r; and borrowing constraint, $\underline{a}$, affect the MPC distribution. Nevertheless, MPCs always fall with earnings growth uncertainty, regardless of the parameter choice. This stands in stark contrast with the data: MPCs are increasing and concave in earnings uncertainty even within groups of households with different discount factors and risk aversion.

Permanent income heterogeneity Permanent differences in income do not change our conclusions that MPCs fall with σ in the model. To see this, assume that household's income is the product of a stochastic component y, defined as above, and a permanent component p, heterogeneous across households. Then one can show that the model scales exactly. In other words, the consumption policy function satisfies: $c\left(a, y, p\right) = c\left(\frac{a}{p}, y\right) p$. As such, the MPC is unaffected. Even if we assumed that p and σ were correlated, the relationship between MPCs and σ would be the same as in Figure 3. This is because the stationary distribution of $\frac{a}{p}$ and, in turn, of the MPC, is independent of p conditional on σ.

Mechanisms over the life cycle Our baseline model abstracts from life-cycle considerations, motivated by our empirical results that MPCs are increasing and concave in uncertainty even within different age groups. Nevertheless, the model implications outlined thus far broadly hold also in a life-cycle model. In this theoretical framework, MPCs can be U-shaped, as shown by Meghir and Pistaferri (2011) and Kaplan and Violante (2010). They are high for young households, which are closer to the borrowing constraint, but increase again later in life, due to a shortening time horizon. The latter channel has little quantitative impact on our analysis since our sample focuses on employed households. For the remainder of the distribution, the forces at play are similar to those in our infinite-horizon model, with MPCs typically declining with σ across households due to wealth accumulation patterns.

Labor supply The model predicts a negative relationship between MPCs and earnings uncertainty even when we allow for endogenous labor supply, as we show in Appendix C.4.

In doing so, we exploit the fact that earnings growth uncertainty in the SCE is elicited conditional on remaining at the same job, at the same workplace, and working the exact same number of hours.

Different financial constraints A marked discrepancy between the model and the data concerns the relationship between MPCs and net liquid wealth. Several recent papers have showed that this relationship is, at best, not empirically as strong as in the canonical model. In particular, MPCs *increase* with net liquid wealth among net debtors. Koşar et al. (2023) document this pattern using various datasets and propose an explanation based on debt repayment motives. As in their paper, we consider a nonlinear pricing schedule such that the price of debt depends on the debt level, and augment their model to include risk heterogeneity. Relative to Figure 4, the model is closer to the data insofar as the MPC in the lowest wealth quartile is close to the one in the second quartile. This, coupled with low-risk households being more likely to be net borrowers, might in principle result in MPCs increasing with uncertainty. However, we find that reasonable calibrations imply that MPCs still fall with earnings uncertainty even in this model. There are two main reasons. First, even though they have lower MPCs than households with little debt, heavy borrowers in this model still have much higher MPCs than wealthy households, standing in contrast with what observed in the data. Second, a nonlinear pricing schedule does not only make the consumption function locally convex, but also alters the relationship between MPCs and risk at a given level of wealth, in ways that take the model further away from the data. We show these mechanisms in Appendix C.5 and conclude that debt repayment motives cannot be the only explanation for our empirical findings.

We also show, in Appendix C.6, that our results are little affected if we consider an earnings-based borrowing constraint, in which households can borrow up to a fraction of their current labor income.

Deviations from FIRE A particularly strong assumption that we have made in the model is that all the heterogeneity in earnings growth uncertainty in the SCE can be ascribed to the cross-sectional variation in realized earnings risk. Quantitatively, uncertainty in the SCE is much less dispersed than risk that can be inferred from realized earnings (see Wang (2023)). One potential explanation for this is that households have private information that is not observed by the econometrician. While this plausible possibility reinforces the fact that our measure of uncertainty is the *correct* one in terms of household decisions, it opens up the discussion of whether we should depart from the full-information rational-expectations (FIRE) benchmark to rationalize our empirical findings.

Recent papers have showed how deviations from FIRE or behavioral mechanisms can indeed increase the MPC. For instance, Bianchi et al. (2024) show that diagnostic expectations lead to a higher MPC than under rational expectations. Pfäuti et al. (2024) propose a mechanism by which persistently overconfident households are more likely to be hand-to-mouth and, in turn, display higher MPCs in the model. Graham and McDowall (2024) document how a model of mental accounts can generate higher MPCs. In general, however, these papers do not investigate the relationship between the MPC and risk. An exception is Iao (2024), who actually shows that MPCs typically fall with risk conditional on wealth in a model of mental accounts. This channel would likely make the cross-sectional risk-MPC relationship even more negative, and thus we conclude that mental accounting is not likely to rationalize our empirical results.

A more promising avenue might be to consider models featuring "misperceptions". In this final part of the paper, we focus on three possible approaches along these lines.

One option is to have a model where households are simply wrong about the true extent of idiosyncratic risk they face. For instance, we consider a setting in which households perceive uncertainty as observed in the SCE, but their realized earnings follow a homoskedastic process, with standard deviation of innovations approximately equal to the median level of uncertainty in the data. This implies that the most (least) uncertain households overpredict (underpredict) true risk. This raises the MPC of high-uncertainty households, as their consumption function is concave, but they do not move along the curve as much. Even this fairly extreme case, however, has little quantitative pull: in this model, the MPC is slightly flatter in uncertainty, but still broadly declining (even slightly U-shaped), as we show in Appendix C.7. An alternative is to assume that perceived uncertainty is always lower than the dispersion of earnings realizations, as recently documented by Caplin et al. (2023). In this case, MPCs fall with perceived uncertainty even more steeply than in our baseline. Intuitively, higher realized risk increases the variance of the asset distribution: when realized risk is higher than what is perceived, more households are pushed against the borrowing constraint.[30]

A second option is that households misperceive their wealth. Lian (2023) sets up a framework of this type, in which future consumption mistakes lead to higher MPCs. This setting has the potential to get the model closer to the data, by the virtue of flattening the relationship between MPC and wealth. The overall success of the model, however, hinges on the specific assumptions on the quantitative nature of wealth misperceptions, and potentially

[30]The net effect on the average MPC depends on the interaction between highly nonlinear forces and, most importantly, the specific form and extent of misperceptions. We are not aware of any dataset in which the relationship between perceived and realized risk could be easily tested at the *individual* level.

how they correlate with uncertainty, which are, again, very difficult to test empirically.[31]

A third option is to consider a model in which households have limited cognitive perception of their optimal policy function, as in Ilut and Valchev (2023). In what follows, we show that this approach gets closest to our empirical findings, even without resorting to hardwired quantitative assumptions. Thus, we see this as the most promising avenue for future research.

5.3.1 A partial solution to our empirical puzzle

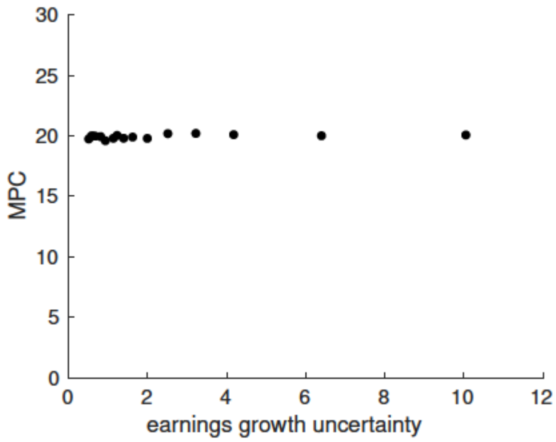
Ilut and Valchev (2023) formalize a model of bounded rationality in which the reasoning of economic agents is the result of the interplay between automatic thinking (i.e., through intuitive associations) and analytical thinking (which is cognitively costly). The authors show that this framework helps address various existing puzzles related to consumption behavior, such as (i) large MPCs of high-liquidity households, and (ii) persistent hand-to-mouth status. We extend their framework to allow for risk heterogeneity, calibrated as before to the uncertainty observed in the SCE data. We maintain the same cognitive parameters as in their paper: the details are discussed in Appendix C.8.[32] With this parameterization, the model is able to generate MPCs that are slightly increasing in earnings growth uncertainty, as we show in Figure 6.

The partial success of the model is the result of two mechanisms. First, the model generates stable behavior characterized by a consumption policy function that is steeper than the permanent-income-hypothesis counterpart. In other words, as discussed by Ilut and Valchev (2023), this mechanism raises the MPC of the wealthy. Even in our environment with risk heterogeneity, this implies a flattening of the MPC–wealth gradient: as shown in Figure 6b, the curves for wealth quartiles 2–4 overlap, close to what is observed in the data. Second, the presence of learning traps subdues wealth accumulation. The curves of Figure 6b do not shift to the right as wealth increases, differently from the canonical model and closer to what is observed in the data. In other words, the model is successful insofar as there are many low-wealth households who perceive high earnings uncertainty and high-wealth households with low uncertainty. Differently from the data, however, households in the lowest quartile of net liquid wealth have much higher MPCs than everyone else. Because lower-uncertainty households are still slightly more likely to be hand-to-mouth in this model, this force makes the MPC–uncertainty gradient less positive.

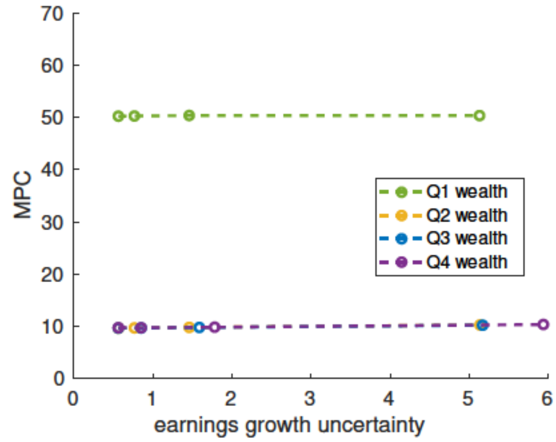
[31] For example, MPCs are positively correlated with the "degree of future mistakes" in this model, as well as with the degree of sophistication. These parameters might also correlate with subjective earnings uncertainty, in turn affecting the relationship between MPC and subjective uncertainty.

[32] We thank Cosmin Ilut and Rosen Valchev for sharing their codes and for insightful discussions.

Figure 6: MPC and uncertainty: bounded rationality



(a) Full distribution



(b) Wealth quartiles

Note: Data simulated from the model by Ilut and Valchev (2023), extended with risk heterogeneity, as discussed in the text. In the right panel, households are grouped in four quartiles of net liquid wealth (a), from the lowest (Q1, in green) to the highest (Q4, in purple). For each quartile of wealth, dots represent quantiles of earnings growth uncertainty.

It should be noted that the quantitative success of this model with bounded rationality depends on its parameterization. In particular, MPCs, and their relationship with earnings risk, depend on the parameters that govern the dual reasoning process, as we discuss in Appendix C.8. For example, we find that MPCs are typically increasing in (i) the prior uncertainty over the true policy function, and (ii) the parameter controlling the notion of similarity between contexts. Hence, a correlation between earnings uncertainty and any of these parameters would take the model even closer to the data. However, disciplining these parameters, and especially heterogeneity thereof, is a challenging endeavor that requires data beyond the scope of this paper.

In summary, we see our empirical evidence as a puzzle for conventional theories of precautionary savings. Not only is the standard workhorse model with risk heterogeneity at odds with the data, but there are also no obvious extensions in the FIRE framework that could reconcile the model with the empirical facts. We have showed which specific mechanisms, central to the canonical model, do not find support in the data. Our findings point to an important role of latent heterogeneity, but one that goes beyond standard risk heterogeneity or common forms of preference heterogeneity.[33] For instance, specific correlations between preferences and uncertainty might rationalize the empirical findings but find little support in

[33]One such form of non-standard preference heterogeneity, which we unfortunately cannot test in the data, involves temptation. Attanasio et al. (2024) show how temptation preferences generate demand for illiquidity and, in turn, high MPCs. Even in this setup, however, we would need to take a stand on how temptation and subjective uncertainty correlate in order for the model to generate the observed empirical facts.

the data. We have also showed that deviations from FIRE seem the most promising avenue to reconcile consumption–savings models with our empirical findings. Recent theories of bounded rationality, such as the one by Ilut and Valchev (2023), are especially promising. We have highlighted which channels lie behind this success, and which mechanisms do not instead find support in our empirical findings. The quantitative performance of these models depends on how the structural parameters are disciplined. New empirical evidence is needed to ensure researchers are up to this task: we hope our work can prompt additional research on this.

6 Conclusions

We have used directly elicited measures of households' subjective uncertainty to empirically document how uncertainty relates to marginal propensities to consume across households. Our main finding is that the MPC is increasing and concave in measures of uncertainty. This contrasts the predictions of a canonical consumption-savings model, in which strong precautionary saving motives, and MPCs declining with wealth, imply that MPCs also decline with earnings risk. We have discussed how several extensions of the canonical model remain at odds with the data, while specific theories that deviate from the FIRE framework can in fact rationalize our empirical evidence. In general, we see our findings as highlighting not only the disconnect between canonical models and data, but also the underlying mechanisms that do not find support in the data. We hope to stimulate further research on resolutions to such empirical consumption puzzles, both in terms of structural models, as well as in the empirical facts needed to discipline theory.

Our empirical findings also show that much of the uncertainty perceived by households, as well their consumption-income sensitivity, are driven by latent, unobserved traits. This corroborates a recent, burgeoning, literature that has highlighted the importance of incorporating latent heterogeneity in macroeconomic models.

Finally, our paper offers a novel example of how household surveys can be used to inform and discipline heterogeneous-agent macroeconomic models. Probabilistic surveys allow direct measurements of objects that, while being crucial for structural models of economic behavior, are often hard to identify in standard datasets. We hope our work will spur further research in this direction.

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A Data appendix

Year-ahead household spending growth expectations are elicited via the following question:

Now we would like you to think about the different things that may happen to the total spending of all members of your household (including you) over the next 12 months. What do you expect will happen to the total spending of all members of your household (including you) over the next 12 months?

increase by 12% or more	______	*percent chance*
increase by 8% to 12%	______	*percent chance*
increase by 4% to 8%	______	*percent chance*
increase by 2% to 4%	______	*percent chance*
increase by 0% to 2%	______	*percent chance*
decrease by 0% to 2%	______	*percent chance*
decrease by 2% to 4%	______	*percent chance*
decrease by 4% to 8%	______	*percent chance*
decrease by 8% to 12%	______	*percent chance*
decrease by 12% or more	______	*percent chance*
Total	100	

The net liquid wealth measure we use in our analysis is based on questions from the SCE Housing Survey between the years 2014-2020. In particular, we subtract gross unsecured debt from liquid wealth. The latter is the amount that households report to have invested in checking accounts or cash, savings accounts, money market funds, Certificates of Deposit, Government/Municipal Bonds or Treasury Bills, and stocks or bonds in publicly held corporations, stock or bond mutual funds, or investment trusts. The question explicitly states to "NOT include any investments in retirement accounts (401k, 403b, 457, IRA, thrift savings plans etc.) or employer-sponsored pensions". Gross unsecured debt is the reported "current total outstanding debt, EXCLUDING all housing debt (such as mortgage debt, home equity loans, and lines of credit)".

Because the question is asked in bins, we assign the respondent the midpoint of their selected bin for both liquid wealth and gross unsecured debt. For debt, we assign $125,000 when respondents choose *$100,000 or more*. For liquid wealth, if the respondent chooses *Less than $500*, we assign $249.50, and for *$1,000,000 or more* we assign $1,250,000. Respondents can also state they hold exactly zero liquid wealth. The Housing survey is fielded every February, so we only observe respondents' net household wealth once a year. In matching this information with observations at monthly frequency, we use the same wealth value across all observations of a respondent in the same year. Since wealth is measured in February, before any spending module containing MPC information for that year, wealth is always predetermined with respect to the MPC in our empirical analysis.

The year-ahead earnings growth expectations questions are included in the survey since June 2013, while the MPC questions are included starting from 2015. For this reason the majority of our analysis uses data from 2015 to 2023. Wealth variables are included in the survey once a year, starting from 2014 February and matched to the rest of the data as described above. This implies that we have information for uncertainty, MPCs and wealth for observations between 2015 to 2020. The tables in Section B.9 use measures of risk aversion and patience. Both the self-assessed risk taking behavior and patience are elicited the first time each respondent takes the survey and only once during a respondent's tenure. The risk aversion question is included in the survey since April 2015, while the patience question is included in the survey since March 2016.

To consider alternative definitions of the MPC, we first use survey questions that were designed and studied by Fuster et al. (2020). In these questions respondents are asked:

Now consider a hypothetical situation where you unexpectedly receive a one-time payment of $500 today.
We would like know whether this extra income would cause you to change your spending behavior in any way over the next 3 months.
Please select only one

- ❍ *Over the next 3 months, I would spend/donate more than if I had not received the $500.*
- ❍ *Over the next 3 months, I would spend/donate the same as if I had not received the $500.*
- ❍ *Over the next 3 months, I would spend/donate less than if I had not received the $500.*

You indicated that you would increase your spending/donations over the next 3 months following the receipt of the $500 payment.
How much more would you spend/donate than if you had not received the $500?

Next, we fielded an alternative MPC question in the September 2023 SCE. The question reads as follows, and results using this MPC measure are reported in Table B.24 and B.25.

Suppose tomorrow you were to receive an unexpected, one-time payment equivalent to 10% of your total pre-tax annual household income. Please indicate how you would allocate this extra income over the next 3 months…

Finally, we describe the data used in Section B.13. We included vignettes that vary the uncertainty in year-ahead earnings growth in the November 2023, March 2024, July 2024, and November 2024 SCE waves. In these modules, each respondent received three scenarios. The first scenario tells the respondents that their year-ahead earnings growth will be exactly the same as they expect, with certainty.[1] The second scenario specified a case in which the respondent's year-ahead earnings growth would be $x + \delta$ with probability p, and $x - \delta$ with probability $1 - p$, where x is their previously reported expectation. The scenario introduced a mean-preserving spread and we set $p = 0.5$ such that uncertainty is δ. The third scenario specified a case in which the respondent's year-ahead earnings growth would be $x + \delta$ with probability $\tilde{p}$, $x - \delta$ with probability $\tilde{p}$, and x with probability $1 - 2\tilde{p}$, where $\tilde{p}$ was set to 0.25. This scenario once again introduced a mean-preserving spread and the implied uncertainty is $\delta\sqrt{2\tilde{p}}$. After each scenario, we elicited respondents' MPCs using the exact question wording we have in the SCE. We vary δ across randomization groups within waves and across waves, in order to span various values of implied uncertainty. Overall, different scenarios covered a range of uncertainty levels from 0 to 7.1.

B Additional empirical results

B.1 Household Income Variability

Table B.1: Household Income Variability and Earnings Growth Expectations

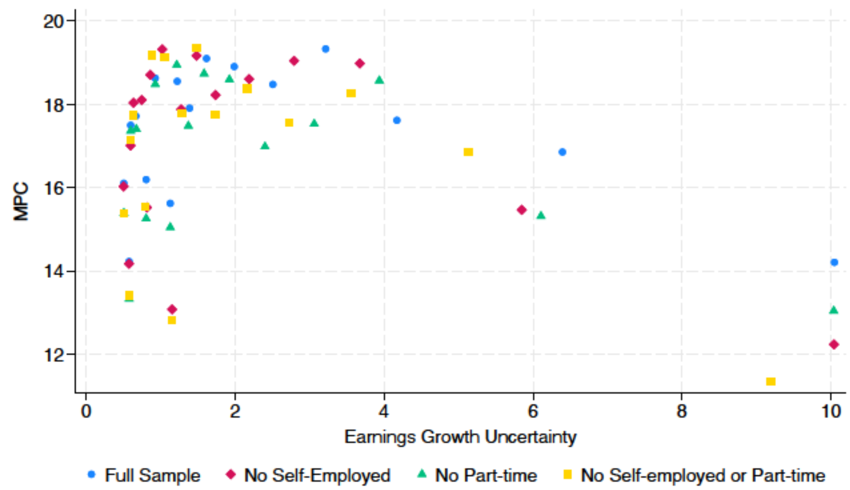
How much does your hh income change from month to month ..	Earnings Growth Uncertainty
Vary by less than 5%	1.87
Vary between 5% and 15%	3.36***
Vary by more than 15%	3.82***
Observations	17,459

Note: The stars show the significance of pairwise tests for equality of means against the "Vary by less than 5%" group. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Household income variability question is included in the SCE Household Spending Survey, which is fielded every 4 months.

[1] In March, July, and November 2024 surveys, we explicitly reminded the respondents about their earnings growth forecasts and used their year-ahead earnings growth point forecasts.

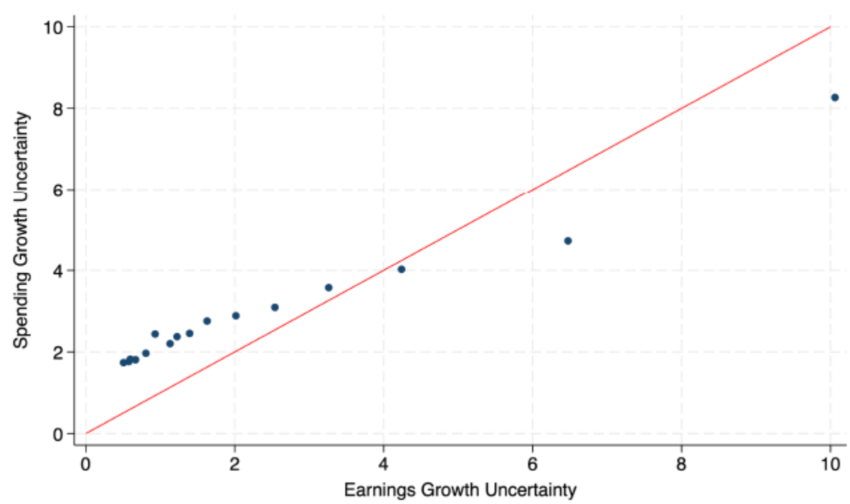
B.2 Earnings growth and spending growth uncertainty

Figure B.1: MPC and Earnings Uncertainty by Worker Status



Note: The figure shows a binned scatterplot of MPC and earnings growth uncertainty, in the SCE, sample period 2015-2023. Total number of observations in the four samples are: 17,312 (full sample), 15,614 (no self-employed), 14,665 (no part-time), 13,607 (no self-employed or part-time).

Figure B.2: Spending growth uncertainty vs Earnings growth uncertainty



Note: The figure shows a binned scatterplot of MPC and earnings growth uncertainty, in the SCE, sample period 2015-2023. The linear fitted slope is 0.631, statistically different from 0, as well as from 1, at the 1% level. A 45-degree line is shown in red.

Table B.2: Drivers of earnings growth uncertainty

	(1)	(2)	(3)	(4)	(5)
Net Liquid Wealth (in 10000s)	0.002***	0.001	0.002**	0.001	0.002*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
HH Income (in 10000s)	-0.027***	-0.030***	-0.020***	-0.023***	-0.037***
	(0.004)	(0.004)	(0.006)	(0.006)	(0.006)
Individual Earnings (in 10000s)	-0.011**	0.009	0.001	-0.006	0.001
	(0.005)	(0.006)	(0.008)	(0.007)	(0.008)
Ages 35-50	-0.232***	-0.299***	-0.341***	-0.207***	-0.270***
	(0.038)	(0.043)	(0.052)	(0.050)	(0.057)
Ages 51+	-0.356***	-0.530***	-0.613***	-0.434***	-0.429***
	(0.041)	(0.046)	(0.058)	(0.057)	(0.067)
Working PT		0.188***	0.258***	0.275***	0.320***
		(0.065)	(0.080)	(0.080)	(0.093)
Self-employed		2.193***	2.553***	2.179***	1.977***
		(0.405)	(0.514)	(0.502)	(0.666)
Female			-0.011	-0.015	-0.006
			(0.044)	(0.042)	(0.049)
Married			-0.216***	-0.182***	-0.133**
			(0.053)	(0.052)	(0.060)
Middle Risk Aversion			-0.170***	-0.149***	-0.194***
			(0.050)	(0.049)	(0.059)
High Risk Aversion			-0.257***	-0.196***	-0.357***
			(0.059)	(0.058)	(0.068)
College Graduate			-0.176***	-0.170***	-0.167***
			(0.044)	(0.042)	(0.050)
Expected Earnings Growth				0.136***	0.152***
				(0.012)	(0.013)
Mean 1yr Inflation Exp.				-0.018***	-0.032***
				(0.007)	(0.007)
Patience					-0.131***
					(0.037)
Constant	2.311***	2.333***	2.713***	2.281***	2.543***
	(0.041)	(0.072)	(0.107)	(0.115)	(0.146)
Industry Controls		✓	✓	✓	✓
Dep. Var. Mean	1.792	1.743	1.746	1.749	1.778
Adj. R-Squared	0.010	0.031	0.039	0.099	0.113
Observations	21,580	14,504	10,513	10,468	8,263

Note: Time period: 2014-2020. (Inverse) Risk Aversion is a categorical scale variable on willingness to take risks in daily activities, measured in February since 2016. We define "high risk aversion" as 1,2 on the scale, "middle risk aversion" as 3,4 on the scale, and "low risk aversion" as 5,6,7 on the scale. We leave out the "low risk aversion" group in the regression. Patience is a categorical scale variable on whether the respondent, in comparison to others, is a person who is generally willing to give up something today in order to benefit in the future. We define "low patience" as 1–4 on the scale, "medium patience" as 5–6, and "high patience" as 7–10. We leave out the "low patience" group in the regression. Since patience is measured in February starting from the 2017 Housing module, thus reducing the sample size, we include it in a separate column. 18 industry controls are added based on standard classification systems. Inflation expectations are one-year ahead. Heteroskedasticity-robust standard errors are reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B.3: Drivers of spending growth uncertainty

	(1)	(2)	(3)	(4)	(5)
Net Liquid Wealth (in 10000s)	-0.001	-0.002	-0.002	-0.003*	-0.003
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)
HH Income (in 10000s)	-0.018*	-0.014	-0.002	-0.003	-0.018
	(0.009)	(0.012)	(0.014)	(0.013)	(0.015)
Individual Earnings (in 10000s)	-0.038***	-0.050***	-0.055***	-0.056***	-0.052**
	(0.013)	(0.017)	(0.019)	(0.019)	(0.021)
Ages 35-50	-0.242**	-0.248**	-0.319**	-0.242*	-0.320**
	(0.102)	(0.123)	(0.133)	(0.124)	(0.139)
Ages 51+	-0.220*	-0.286**	-0.365**	-0.246*	-0.211
	(0.113)	(0.135)	(0.148)	(0.140)	(0.168)
Working PT		-0.254	-0.175	-0.094	-0.102
		(0.167)	(0.179)	(0.172)	(0.201)
Self-employed		2.739*	3.028*	1.361	1.823
		(1.570)	(1.822)	(1.113)	(1.428)
Female			0.024	-0.031	-0.077
			(0.116)	(0.110)	(0.129)
Married			-0.219*	-0.239*	-0.184
			(0.127)	(0.126)	(0.148)
Middle Risk Aversion			-0.193	-0.195*	-0.250*
			(0.118)	(0.115)	(0.138)
High Risk Aversion			-0.250*	-0.206	-0.296*
			(0.141)	(0.140)	(0.168)
College Graduate			-0.165	-0.131	-0.166
			(0.113)	(0.108)	(0.130)
Expected Earnings Growth				0.057***	0.067***
				(0.019)	(0.022)
Mean 1yr Inflation Exp.				0.016	0.017
				(0.016)	(0.018)
Patience					-0.043
					(0.087)
Constant	2.937***	3.012***	3.303***	3.026***	3.239***
	(0.112)	(0.187)	(0.244)	(0.257)	(0.318)
Industry Controls		✓	✓	✓	✓
Dep. Var. Mean	2.348	2.327	2.318	2.312	2.326
Adj. R-Squared	0.010	0.027	0.032	0.032	0.039
Observations	3,865	2,566	2,374	2,354	1,845

Note: Time period: 2014-2020. Spending growth uncertainty is measured as the standard deviation of an individual's density forecast for year-ahead spending growth. (Inverse) Risk Aversion is a categorical scale variable on willingness to take risks in daily activities, measured in February since 2016. We define "high risk aversion" as 1,2 on the scale, "middle risk aversion" as 3,4 on the scale, and "low risk aversion" as 5,6,7 on the scale. We leave out the "low risk aversion" group in the regression. Patience is a categorical scale variable on whether the respondent, in comparison to others, is a person who is generally willing to give up something today in order to benefit in the future. We define "low patience" as 1–4 on the scale, "medium patience" as 5–6, and "high patience" as 7–10. Since patience is measured in February starting from the 2017 Housing module, thus reducing the sample size, we include it in a separate column. 18 industry controls are added based on standard classification systems. Inflation expectations are one-year ahead. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

B.3 Inflation expectations

Table B.4: MPC and Earnings Uncertainty: Inflation Expectations

	(1)	(2)	(3)	(4)	(5)
Earnings Growth Uncertainty	0.864***	0.887***	0.842***	0.956***	0.258
	(0.171)	(0.186)	(0.186)	(0.351)	(0.847)
Uncertainty squared	-0.082***	-0.083***	-0.079***	-0.082***	-0.047
	(0.014)	(0.014)	(0.014)	(0.024)	(0.062)
Expected Earnings Growth		-0.015	-0.011	-0.136	0.118
		(0.040)	(0.040)	(0.083)	(0.159)
Expected Inflation	-0.179***	-0.176***	-0.218***	-0.139*	-0.085
	(0.033)	(0.033)	(0.034)	(0.082)	(0.116)
Inflation Uncertainty	-0.048	-0.054	-0.107	-0.085	-0.117
	(0.079)	(0.081)	(0.081)	(0.187)	(0.393)
Controls	✓	✓	✓	✓	✓
Year Dummies			✓	✓	
Net liquid wealth over income				✓	✓
Individual Fixed Effects					✓
Dep. Var. Mean	16.650	16.650	16.650	16.038	16.120
Adj. R-Squared	0.019	0.019	0.022	0.018	0.386
Observations	17,082	17,082	17,082	4,073	2,541

Note: Robust standard errors are included in parentheses and are clustered at the individual level in column 5. Time period: 2015-2023 for columns 1-3 and 2015-2020 for columns 4 and 5. Earnings growth uncertainty is measured as the standard deviation of an individual's density forecast for year-ahead earnings growth. Expected inflation is the mean of an individual's density forecast for year-ahead inflation and inflation uncertainty is the standard deviation of this density. Sample only includes employed individuals. Controls include log household income and dummy variables for college education, part time work status, self-employment status, marital status, white vs non-white, gender, and age groups (25-34,35-50,51-65). Net liquid wealth over income is winsorized at the 5th and 95th percentile and available only until 2020. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

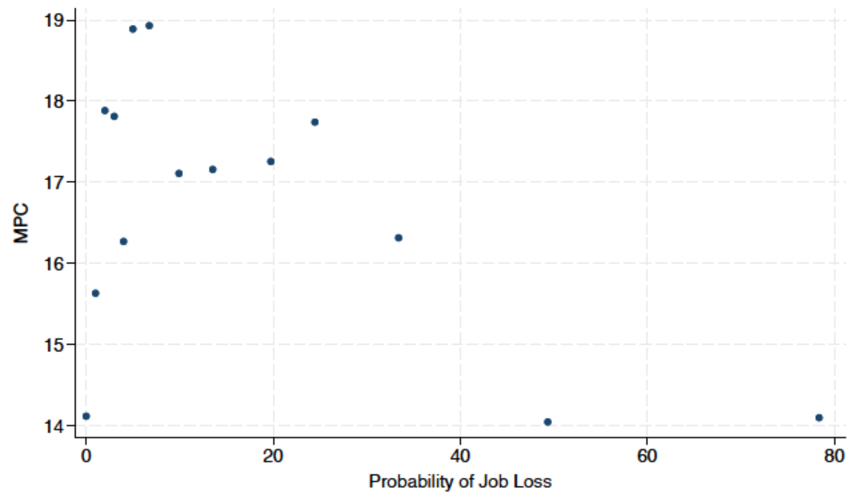
Table B.5: MPC and Spending Uncertainty: Inflation Expectations

	(1)	(2)	(3)	(4)	(5)
Spending Growth Uncertainty	1.460***	1.354***	1.314***	0.973***	0.275
	(0.162)	(0.166)	(0.166)	(0.312)	(0.611)
Uncertainty squared	-0.098***	-0.100***	-0.097***	-0.080***	-0.006
	(0.014)	(0.014)	(0.014)	(0.024)	(0.046)
Expected Spending Growth		0.116***	0.107***	0.148**	0.004
		(0.031)	(0.032)	(0.061)	(0.098)
Expected Inflation	-0.180***	-0.231***	-0.265***	-0.179**	-0.070
	(0.032)	(0.035)	(0.035)	(0.081)	(0.117)
Inflation Uncertainty	-0.293***	-0.200**	-0.245***	-0.101	-0.137
	(0.082)	(0.084)	(0.085)	(0.193)	(0.396)
Controls	✓	✓	✓	✓	✓
Year Dummies			✓	✓	
Net liquid wealth over income				✓	✓
Individual Fixed Effects					✓
Dep. Var. Mean	16.665	16.666	16.666	16.017	16.097
Adj. R-Squared	0.023	0.024	0.026	0.020	0.382
Observations	17,105	17,104	17,104	4,081	2,550

Note: Robust standard errors are included in parentheses and are clustered at the individual level in column 5. Time period: 2015-2023 for columns 1-3 and 2015-2020 for columns 4 and 5. Spending growth uncertainty is measured as the standard deviation of an individual's density forecast for year-ahead spending growth. Expected inflation is the mean of an individual's density forecast for year-ahead inflation and inflation uncertainty is the standard deviation of this density. Sample only includes employed individuals. Controls include log household income and dummy variables for college education, part time work status, self-employment status, marital status, white vs non-white, gender, and age groups (25-34,35-50,51-65). Net liquid wealth over income is winsorized at the 5th and 95th percentile and available only until 2020. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

B.4 Job loss probability

Figure B.3: MPC and Job Loss Probability



Note: The figure shows a binned scatterplot of MPC and earnings growth uncertainty, in the SCE, sample period 2015-2023. Total number of observations: 15,714.

Table B.6: MPC and Earnings Uncertainty with Expected Job Loss

	(1)	(2)	(3)	(4)	(5)
Earnings Growth Uncertainty	0.742***	0.804***	0.751***	0.910**	0.686
	(0.183)	(0.198)	(0.197)	(0.389)	(0.829)
Uncertainty squared	-0.079***	-0.083***	-0.080***	-0.087***	-0.058
	(0.015)	(0.016)	(0.016)	(0.031)	(0.062)
Expected Earnings Growth		-0.044	-0.043	-0.117	0.025
		(0.042)	(0.042)	(0.084)	(0.130)
Percent Chance of Job Loss in 12mths	-0.021**	-0.022**	-0.020**	0.000	0.067*
	(0.009)	(0.009)	(0.009)	(0.018)	(0.035)
Controls	✓	✓	✓	✓	✓
Year Dummies			✓	✓	
Net liquid wealth over income				✓	✓
Individual Fixed Effects					✓
Dep. Var. Mean	16.402	16.402	16.402	15.632	15.789
Adj. R-Squared	0.015	0.015	0.017	0.011	0.370
Observations	15,497	15,497	15,497	3,689	2,299

Note: Robust standard errors are included in parentheses and are clustered at the individual level in column 5. Time period: 2015-2023 for columns 1-3 and 2015-2020 for columns 4 and 5. Earnings growth uncertainty is measured as the standard deviation of an individual's density forecast for year-ahead earnings growth. Sample only includes employed individuals. Controls include log household income and dummy variables for college education, part time work status, self-employment status, marital status, white vs non-white, gender, and age groups (25-34,35-50,51-65). Net liquid wealth over income is winsorized at the 5th and 95th percentile and available only until 2020. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B.7: MPC and Spending Uncertainty with Expected Job Loss

	(1)	(2)	(3)	(4)	(5)
Spending Growth Uncertainty	1.117***	1.234***	1.192***	1.039***	0.415
	(0.173)	(0.175)	(0.175)	(0.335)	(0.656)
Uncertainty squared	-0.084***	-0.102***	-0.100***	-0.091***	0.004
	(0.015)	(0.015)	(0.015)	(0.028)	(0.052)
Expected Spending Growth		0.067**	0.057*	0.154**	0.020
		(0.030)	(0.030)	(0.061)	(0.104)
Percent Chance of Job Loss in 12mths	-0.025***	-0.025***	-0.024**	0.000	0.066*
	(0.009)	(0.009)	(0.009)	(0.018)	(0.035)
Controls	✓	✓	✓	✓	✓
Year Dummies			✓	✓	
Net liquid wealth over income				✓	✓
Individual Fixed Effects					✓
Dep. Var. Mean	16.397	16.399	16.399	15.600	15.738
Adj. R-Squared	0.017	0.018	0.019	0.015	0.366
Observations	15,514	15,512	15,512	3,694	2,305

Note: Robust standard errors are included in parentheses and are clustered at the individual level in column 5. Time period: 2015-2023 for columns 1-3 and 2015-2020 for columns 4 and 5. Spending growth uncertainty is measured as the standard deviation of an individual's density forecast for year-ahead spending growth. Sample only includes employed individuals. Controls include log household income and dummy variables for college education, part time work status, self-employment status, marital status, white vs non-white, gender, and age groups (25-34,35-50,51-65). Net liquid wealth over income is winsorized at the 5th and 95th percentile and available only until 2020. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

B.5 Alternative definitions of uncertainty

Table B.8: MPC and Earnings Uncertainty using Discrete Approximation of Subjective Probability Functions

	(1)	(2)	(3)	(4)	(5)
Earnings Growth Uncertainty	1.155***	1.200***	1.175***	1.095***	0.191
	(0.118)	(0.122)	(0.122)	(0.229)	(0.535)
Uncertainty squared	-0.087***	-0.090***	-0.088***	-0.083***	-0.038
	(0.009)	(0.009)	(0.009)	(0.016)	(0.041)
Expected Earnings Growth		-0.047	-0.048	-0.157**	0.062
		(0.034)	(0.034)	(0.071)	(0.139)
Controls	✓	✓	✓	✓	✓
Year Dummies			✓	✓	
Net liquid wealth over income				✓	✓
Individual Fixed Effects					✓
Dep. Var. Mean	16.645	16.645	16.645	15.996	16.060
Adj. R-Squared	0.020	0.020	0.022	0.020	0.382
Observations	17,279	17,279	17,279	4,109	2,571

Note: Robust standard errors are included in parentheses and are clustered at the individual level in column 5. Time period: 2015-2023 for columns 1-3 and 2015-2020 for columns 4 and 5. As discussed in the text, we assume that the likelihood assigned to each earnings growth bin represents a probability mass at the midpoints of those bins. Uncertainty is the standard deviation of the resulting distribution. Sample only includes employed individuals. Controls include log household income and dummy variables for college education, part time work status, self-employment status, marital status, white vs non-white, gender, and age groups (25-34,35-50,51-65). Net liquid wealth over income is winsorized at the 5th and 95th percentile and available only until 2020. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B.9: MPC and Spending Uncertainty using Discrete Approximation of Subjective Probability Functions

	(1)	(2)	(3)	(4)	(5)
Spending Growth Uncertainty	1.514***	1.455***	1.439***	1.418***	0.095
	(0.109)	(0.110)	(0.110)	(0.220)	(0.607)
Uncertainty squared	-0.101***	-0.097***	-0.096***	-0.103***	0.010
	(0.008)	(0.008)	(0.008)	(0.016)	(0.052)
Expected Spending Growth		0.092***	0.081***	0.097*	0.027
		(0.025)	(0.026)	(0.054)	(0.090)
Controls	✓	✓	✓	✓	✓
Year Dummies			✓	✓	
Net liquid wealth over income				✓	✓
Individual Fixed Effects					✓
Dep. Var. Mean	16.657	16.657	16.657	16.007	16.072
Adj. R-Squared	0.026	0.026	0.028	0.025	0.382
Observations	17,259	17,259	17,259	4,103	2,571

Note: Robust standard errors are included in parentheses and are clustered at the individual level in column 5. Time period: 2015-2023 for columns 1-3 and 2015-2020 for columns 4 and 5. As discussed in the text, we assume that the likelihood assigned to each spending growth bin represents a probability mass at the midpoints of those bins. Uncertainty is the standard deviation of the resulting distribution. Sample only includes employed individuals. Controls include log household income and dummy variables for college education, part time work status, self-employment status, marital status, white vs non-white, gender, and age groups (25-34,35-50,51-65). Net liquid wealth over income is winsorized at the 5th and 95th percentile and available only until 2020. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B.10: MPC and Earnings Uncertainty: Winsorization

	(1)	(2)	(3)	(4)	(5)
Earnings Growth Uncertainty	1.551***	1.675***	1.608***	1.551***	0.355
	(0.237)	(0.251)	(0.251)	(0.513)	(1.058)
Uncertainty squared	-0.171***	-0.181***	-0.175***	-0.160***	-0.069
	(0.024)	(0.025)	(0.025)	(0.052)	(0.102)
Exp Earnings Growth DM (Winsorized)		-0.068*	-0.068*	-0.176**	0.153
		(0.041)	(0.041)	(0.084)	(0.170)
Controls	✓	✓	✓	✓	✓
Year Dummies			✓	✓	
Net liquid wealth over income				✓	✓
Individual Fixed Effects					✓
Dep. Var. Mean	16.654	16.654	16.654	16.028	16.078
Adj. R-Squared	0.018	0.018	0.020	0.017	0.386
Observations	17,190	17,190	17,190	4,088	2,556

Note: Robust standard errors are included in parentheses and are clustered at the individual level in column 5. Time period: 2015-2023 for columns 1-3 and 2015-2020 for columns 4 and 5. Earnings growth uncertainty is measured as the standard deviation of an individual's density forecast for year-ahead earnings growth. In this table, it is winsorized at the top 99th percentile. Sample only includes employed individuals. Controls include log household income and dummy variables for college education, part time work status, self-employment status, marital status, white vs non-white, gender, and age groups (25-34,35-50,51-65). Net liquid wealth over income is winsorized at the 5th and 95th percentile and available only until 2020. Standard deviation squared takes this into account. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B.11: MPC and Spending Uncertainty: Winsorization

	(1)	(2)	(3)	(4)	(5)
Spending Growth Uncertainty	1.770***	1.663***	1.615***	1.223***	0.200
	(0.168)	(0.178)	(0.178)	(0.344)	(0.713)
Uncertainty squared	-0.155***	-0.148***	-0.145***	-0.116***	0.003
	(0.015)	(0.015)	(0.015)	(0.029)	(0.063)
Exp Spending Growth DM (Winsorized)		0.054*	0.044	0.114*	-0.008
		(0.031)	(0.031)	(0.066)	(0.117)
Controls	✓	✓	✓	✓	✓
Year Dummies			✓	✓	
Net liquid wealth over income				✓	✓
Individual Fixed Effects					✓
Dep. Var. Mean	16.664	16.667	16.667	16.007	16.055
Adj. R-Squared	0.021	0.021	0.022	0.020	0.381
Observations	17,216	17,213	17,213	4,096	2,565

Note: Robust standard errors are included in parentheses and are clustered at the individual level in column 5. Time period: 2015-2023 for columns 1-3 and 2015-2020 for columns 4 and 5. Spending growth uncertainty is measured as the standard deviation of an individual's density forecast for year-ahead spending growth. In this table, it is winsorized at the top 99th percentile. Sample only includes employed individuals. Controls include log household income and dummy variables for college education, part time work status, self-employment status, marital status, white vs non-white, gender, and age groups (25-34,35-50,51-65). Net liquid wealth over income is winsorized at the 5th and 95th percentile and available only until 2020. Standard deviation squared takes this into account. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B.12: MPC and Earnings Uncertainty: No Probability in Tail Bins

	(1)	(2)	(3)	(4)	(5)
Earnings Growth Uncertainty	4.062***	4.529***	4.304***	2.776	-3.309
	(0.850)	(0.896)	(0.897)	(1.704)	(3.030)
Uncertainty squared	-0.680***	-0.782***	-0.729***	-0.292	0.875
	(0.230)	(0.237)	(0.236)	(0.423)	(0.575)
Expected Earnings Growth		-0.140	-0.132	-0.292	0.407
		(0.094)	(0.095)	(0.183)	(0.308)
Controls	✓	✓	✓	✓	✓
Year Dummies			✓	✓	
Net liquid wealth over income				✓	✓
Individual Fixed Effects					✓
Dep. Var. Mean	16.409	16.409	16.409	15.939	15.992
Adj. R-Squared	0.016	0.016	0.018	0.014	0.361
Observations	12,524	12,524	12,524	3,153	1,828

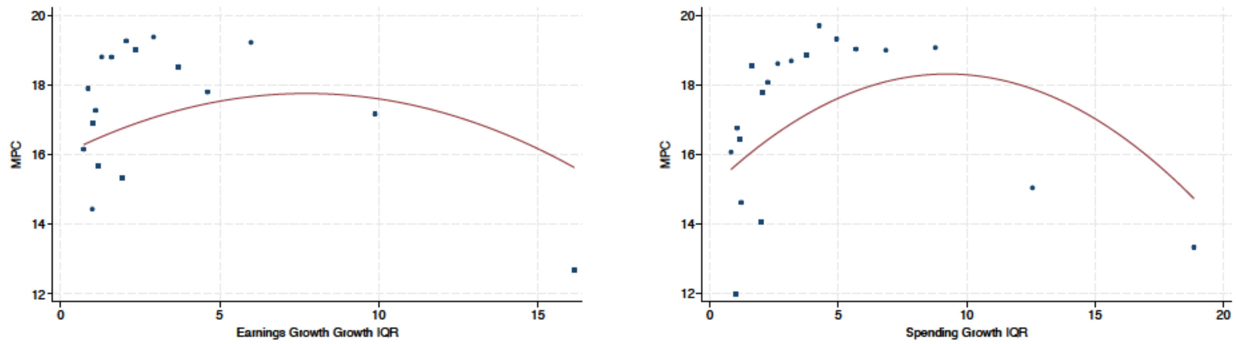
Note: Robust standard errors are included in parentheses and are clustered at the individual level in column 5. Time period: 2015-2023 for columns 1-3 and 2015-2020 for columns 4 and 5. Earnings growth uncertainty is measured as the standard deviation of an individual's density forecast for year-ahead earnings growth. Sample only includes employed individuals. The sample is also restricted to respondents who put zero probability on the tail bins (i.e., "increased by 12% or more" and "decreased by 12% or more"). Controls include log household income and dummy variables for college education, part time work status, self-employment status, marital status, white vs non-white, gender, and age groups (25-34,35-50,51-65). Net liquid wealth over income is winsorized at the 5th and 95th percentile and available only until 2020. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B.13: MPC and Spending Uncertainty: No Probability in Tail Bins

	(1)	(2)	(3)	(4)	(5)
Spending Growth Uncertainty	6.110***	5.379***	5.401***	5.360***	6.244*
	(0.825)	(0.846)	(0.847)	(1.608)	(3.350)
Uncertainty squared	-1.125***	-0.958***	-0.964***	-1.088***	-1.711**
	(0.206)	(0.209)	(0.209)	(0.405)	(0.870)
Expected Spending Growth		0.233***	0.218***	0.080	-0.051
		(0.072)	(0.072)	(0.137)	(0.261)
Controls	✓	✓	✓	✓	✓
Year Dummies			✓	✓	
Net liquid wealth over income				✓	✓
Individual Fixed Effects					✓
Dep. Var. Mean	15.776	15.776	15.776	15.482	15.232
Adj. R-Squared	0.018	0.019	0.021	0.011	0.363
Observations	10,639	10,639	10,639	2,807	1,515

Note: Robust standard errors are included in parentheses and are clustered at the individual level in column 5. Time period: 2015-2023 for columns 1-3 and 2015-2020 for columns 4 and 5. Spending growth uncertainty is measured as the standard deviation of an individual's density forecast for year-ahead spending growth. Sample only includes employed individuals. The sample is also restricted to respondents who put zero probability on the tail bins (i.e., "increased by 12% or more" and "decreased by 12% or more"). Controls include log household income and dummy variables for college education, part time work status, self-employment status, marital status, white vs non-white, gender, and age groups (25-34,35-50,51-65). Net liquid wealth over income is winsorized at the 5th and 95th percentile and available only until 2020. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Figure B.4: MPC and uncertainty: interquartile range



(a) Earnings growth (b) Spending growth

Note: The figure shows a binned scatterplot of (a) MPC and earnings growth uncertainty and (b) MPC and spending growth uncertainty, in the SCE, sample period 2015-2023. Uncertainty is defined as the interquartile range of each individuals' density forecast. Total number of observations: 17,312 for panel (a) and 17,573 for panel (b).

Table B.14: MPC and Earnings Uncertainty: IQR as Uncertainty

	(1)	(2)	(3)	(4)	(5)
Earnings Growth Uncertainty	0.378***	0.395***	0.366***	0.448**	0.031
	(0.101)	(0.109)	(0.109)	(0.207)	(0.519)
Uncertainty squared	-0.024***	-0.024***	-0.023***	-0.025***	-0.010
	(0.005)	(0.005)	(0.005)	(0.009)	(0.023)
Expected Earnings Growth		-0.020	-0.019	-0.130	0.125
		(0.039)	(0.039)	(0.081)	(0.159)
Controls	✓	✓	✓	✓	✓
Year Dummies			✓	✓	
Net liquid wealth over income				✓	✓
Individual Fixed Effects					✓
Dep. Var. Mean	16.654	16.654	16.654	16.028	16.078
Adj. R-Squared	0.017	0.017	0.019	0.017	0.386
Observations	17,190	17,190	17,190	4,088	2,556

Note: Robust standard errors are included in parentheses and are clustered at the individual level in column 5. Time period: 2015-2023 for columns 1-3 and 2015-2020 for columns 4 and 5. Earnings growth uncertainty is measured as the interquartile range of an individual's density forecast for year-ahead earnings growth. Sample only includes employed individuals. Controls include log household income and dummy variables for college education, part time work status, self-employment status, marital status, white vs non-white, gender, and age groups (25-34,35-50,51-65). Net liquid wealth over income is winsorized at the 5th and 95th percentile and available only until 2020. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

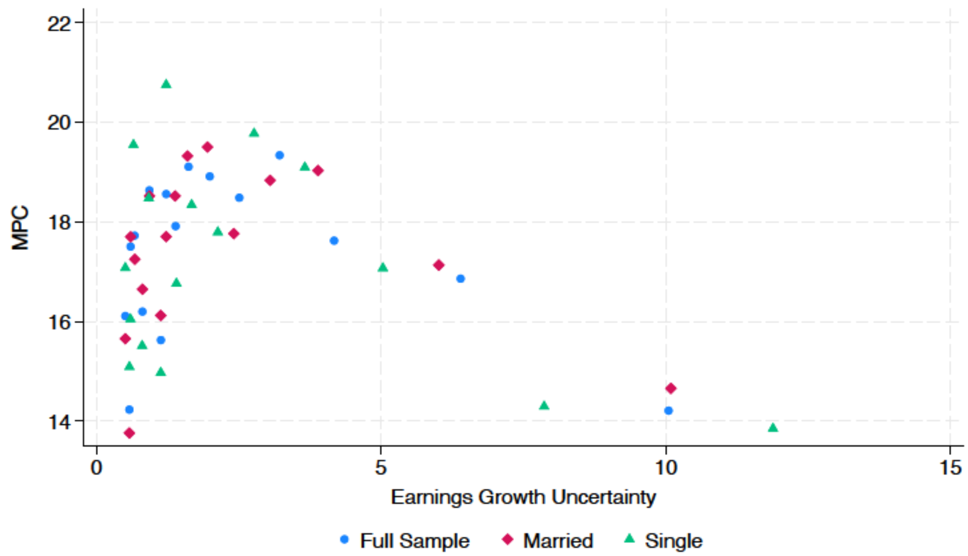
Table B.15: MPC and Spending Uncertainty: IQR as Uncertainty

	(1)	(2)	(3)	(4)	(5)
Spending Growth Uncertainty	0.720***	0.634***	0.605***	0.410**	0.190
	(0.093)	(0.097)	(0.097)	(0.190)	(0.366)
Uncertainty squared	-0.035***	-0.033***	-0.032***	-0.024***	-0.006
	(0.005)	(0.005)	(0.005)	(0.009)	(0.017)
Expected Spending Growth		0.082***	0.073**	0.146**	0.018
		(0.029)	(0.029)	(0.060)	(0.096)
Controls	✓	✓	✓	✓	✓
Year Dummies			✓	✓	
Net liquid wealth over income				✓	✓
Individual Fixed Effects					✓
Dep. Var. Mean	16.664	16.667	16.667	16.007	16.055
Adj. R-Squared	0.019	0.019	0.021	0.018	0.381
Observations	17,216	17,213	17,213	4,096	2,565

Note: Robust standard errors are included in parentheses and are clustered at the individual level in column 5. Time period: 2015-2023 for columns 1-3 and 2015-2020 for columns 4 and 5. Spending growth uncertainty is measured as the interquartile range of an individual's density forecast for year-ahead spending growth. Sample only includes employed individuals. Controls include log household income and dummy variables for college education, part time work status, self-employment status, marital status, white vs non-white, gender, and age groups (25-34,35-50,51-65). Net liquid wealth over income is winsorized at the 5th and 95th percentile and available only until 2020. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

B.6 Household units

Figure B.5: MPC and Earnings Uncertainty by Marital Status



Note: The figure shows a binned scatterplot of MPC and earnings growth uncertainty, in the SCE, sample period 2015-2023. Total number of observations in the four samples are: 17,312 (full sample), 11,609 (married), 5,703 (single).

Table B.16: MPC and Earnings Uncertainty: Marital Status

	(1)	(2)	(3)	(4)	(5)
Earnings Growth Uncertainty	0.560***	0.603**	0.539**	0.802	-1.767
	(0.213)	(0.243)	(0.244)	(0.491)	(1.180)
Married=1 x Earnings Growth Uncertainty	0.372	0.380	0.407	0.183	2.900*
	(0.235)	(0.288)	(0.289)	(0.562)	(1.561)
Uncertainty squared	-0.064***	-0.067***	-0.063***	-0.074*	0.103
	(0.017)	(0.019)	(0.019)	(0.040)	(0.115)
Married=1 x Uncertainty squared	-0.019	-0.019	-0.020	-0.009	-0.203
	(0.022)	(0.024)	(0.024)	(0.046)	(0.135)
Expected Earnings Growth		-0.031	-0.031	-0.181*	0.173
		(0.061)	(0.061)	(0.109)	(0.127)
Married=1 x Expected Earnings Growth		-0.006	-0.004	0.068	-0.110
		(0.078)	(0.078)	(0.155)	(0.299)
Controls	✓	✓	✓	✓	✓
Year Dummies			✓	✓	
Net liquid wealth over income				✓	✓
Individual Fixed Effects					✓
Dep. Var. Mean	16.654	16.654	16.654	16.028	16.078
Adj. R-Squared	0.017	0.017	0.019	0.017	0.383
Observations	17,190	17,190	17,190	4,088	2,556

Note: Robust standard errors are included in parentheses and are clustered at the individual level in column 5. Time period: 2015-2023 for columns 1-3 and 2015-2020 for columns 4 and 5. Sample only includes employed individuals. Controls include log household income and dummy variables for college education, part time work status, self-employment status, white vs non-white, gender, and age groups (25-34,35-50,51-65). Net liquid wealth over income is winsorized at the 5th and 95th percentile and available only until 2020. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B.17: MPC and Spending Uncertainty: Marital Status

	(1)	(2)	(3)	(4)	(5)
Spending Growth Uncertainty	0.856***	0.918***	0.859***	0.692	-1.036
	(0.186)	(0.209)	(0.210)	(0.446)	(0.880)
Married=1 x Spending Growth Uncertainty	0.352*	0.457**	0.483**	0.280	2.120**
	(0.200)	(0.233)	(0.233)	(0.462)	(1.047)
Uncertainty squared	-0.064***	-0.075***	-0.072***	-0.059	0.079
	(0.016)	(0.018)	(0.017)	(0.040)	(0.065)
Married=1 x Uncertainty squared	-0.023	-0.035	-0.036*	-0.025	-0.146*
	(0.020)	(0.022)	(0.022)	(0.043)	(0.082)
Expected Spending Growth		0.082*	0.076*	0.143	0.043
		(0.046)	(0.046)	(0.089)	(0.126)
Married=1 x Expected Spending Growth		-0.023	-0.030	-0.017	-0.047
		(0.059)	(0.059)	(0.119)	(0.183)
Controls	✓	✓	✓	✓	✓
Year Dummies			✓	✓	
Net liquid wealth over income				✓	✓
Individual Fixed Effects					✓
Dep. Var. Mean	16.664	16.667	16.667	16.007	16.055
Adj. R-Squared	0.020	0.020	0.022	0.019	0.378
Observations	17,216	17,213	17,213	4,096	2,565

Note: Robust standard errors are included in parentheses and are clustered at the individual level in column 5. Time period: 2015-2023 for columns 1-3 and 2015-2020 for columns 4 and 5. Spending growth uncertainty is measured as the standard deviation of an individual's density forecast for year-ahead spending growth. Sample only includes employed individuals. Controls include log household income and dummy variables for college education, part time work status, self-employment status, white vs non-white, gender, and age groups (25-34,35-50,51-65). Net liquid wealth over income is winsorized at the 5th and 95th percentile and available only until 2020. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

B.7 Additional robustness checks

Table B.18: MPC and Earnings Uncertainty: Industry dummies

	(1)	(2)	(3)	(4)	(5)
Earnings Growth Uncertainty	0.990***	1.076***	1.034***	1.136***	0.776
	(0.207)	(0.224)	(0.224)	(0.424)	(1.025)
Uncertainty squared	-0.102***	-0.108***	-0.105***	-0.106***	-0.065
	(0.016)	(0.017)	(0.017)	(0.032)	(0.070)
Expected Earnings Growth		-0.062	-0.064	-0.117	-0.048
		(0.049)	(0.049)	(0.093)	(0.180)
Controls	✓	✓	✓	✓	✓
Year Dummies			✓	✓	
Net liquid wealth over income				✓	✓
Individual Fixed Effects					✓
Dep. Var. Mean	16.226	16.226	16.226	15.530	15.736
Adj. R-Squared	0.017	0.018	0.019	0.012	0.359
Observations	10,831	10,831	10,831	2,709	1,716

Note: Robust standard errors are included in parentheses and are clustered at the individual level in column 5. Time period: 2015-2023 for columns 1-3 and 2015-2020 for columns 4 and 5. Earnings growth uncertainty is measured as the standard deviation of an individual's density forecast for year-ahead earnings growth. Sample only includes employed individuals. Controls include log household income and dummy variables for college education, part time work status, self-employment status, marital status, white vs non-white, gender, and age groups (25-34,35-50,51-65). Net liquid wealth over income is winsorized at the 5th and 95th percentile and available only until 2020. All regressions contain two sets of dummies, type of employer (e.g., government, private sector for–profit, nonprofit) and industry (e.g., construction, manufacturing). * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B.19: MPC and Spending Uncertainty: Industry dummies

	(1)	(2)	(3)	(4)	(5)
Spending Growth Uncertainty	1.210***	1.555***	1.511***	1.315***	0.397
	(0.221)	(0.221)	(0.221)	(0.361)	(0.864)
Uncertainty squared	-0.093***	-0.133***	-0.130***	-0.120***	0.035
	(0.020)	(0.019)	(0.019)	(0.028)	(0.073)
Expected Spending Growth		0.027	0.016	0.188***	-0.041
		(0.036)	(0.037)	(0.069)	(0.122)
Controls	✓	✓	✓	✓	✓
Year Dummies			✓	✓	
Net liquid wealth over income				✓	✓
Individual Fixed Effects					✓
Dep. Var. Mean	16.219	16.222	16.222	15.487	15.677
Adj. R-Squared	0.020	0.021	0.022	0.017	0.356
Observations	10,846	10,844	10,844	2,712	1,720

Note: Robust standard errors are included in parentheses and are clustered at the individual level in column 5. Time period: 2015-2023 for columns 1-3 and 2015-2020 for columns 4 and 5. Spending growth uncertainty is measured as the standard deviation of an individual's density forecast for year-ahead spending growth. Sample only includes employed individuals. Controls include log household income and dummy variables for college education, part time work status, self-employment status, marital status, white vs non-white, gender, and age groups (25-34,35-50,51-65). Net liquid wealth over income is winsorized at the 5th and 95th percentile and available only until 2020. All regressions contain two sets of dummies, type of employer (e.g., government, private sector for–profit, nonprofit) and industry (e.g., construction, manufacturing). * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B.20: MPC and Earnings Uncertainty with Credit, Stock Market, and Unemployment Expectations

	(1)	(2)	(3)	(4)	(5)
Earnings Growth Uncertainty	0.767***	0.837***	0.783***	0.911***	0.200
	(0.168)	(0.180)	(0.180)	(0.335)	(0.834)
Uncertainty squared	-0.073***	-0.078***	-0.074***	-0.080***	-0.042
	(0.014)	(0.014)	(0.014)	(0.024)	(0.063)
Expected Earnings Growth		-0.051	-0.050	-0.154*	0.117
		(0.039)	(0.039)	(0.081)	(0.155)
Harder to obtain credit than year ago	0.125	0.121	-0.075	-0.483	0.007
	(0.475)	(0.475)	(0.483)	(1.053)	(1.748)
Harder to obtain credit than one year from now	-0.977**	-0.980**	-1.149**	-0.166	-0.290
	(0.478)	(0.478)	(0.477)	(1.036)	(1.477)
Percent chance of higher avg US stock prices in 12mths	0.055***	0.056***	0.056***	0.038***	-0.010
	(0.007)	(0.007)	(0.007)	(0.014)	(0.030)
Percent chance of higher US unemployment rate in 12mths	0.009	0.008	0.011	0.002	-0.009
	(0.007)	(0.007)	(0.007)	(0.013)	(0.024)
Controls	✓	✓	✓	✓	✓
Year Dummies			✓	✓	
Net liquid wealth over income				✓	✓
Individual Fixed Effects					✓
Dep. Var. Mean	16.648	16.648	16.648	16.011	16.089
Adj. R-Squared	0.021	0.021	0.023	0.018	0.385
Observations	17,170	17,170	17,170	4,085	2,552

Note: Robust standard errors are included in parentheses and are clustered at the individual level in column 5. Time period: 2015-2023 for columns 1-3 and 2015-2020 for columns 4 and 5. Earnings growth uncertainty is measured as the standard deviation of an individual's density forecast for year-ahead earnings growth. Sample only includes employed individuals. Controls include log household income and dummy variables for college education, part time work status, self-employment status, marital status, white vs non-white, gender, and age groups (25-34,35-50,51-65). Net liquid wealth over income is winsorized at the 5th and 95th percentile and available only until 2020. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B.21: MPC and Spending Uncertainty with Credit, Stock Market, and Unemployment Expectations

	(1)	(2)	(3)	(4)	(5)
Spending Growth Uncertainty	1.082***	1.195***	1.141***	0.863***	0.241
	(0.148)	(0.162)	(0.161)	(0.304)	(0.594)
Uncertainty squared	-0.077***	-0.094***	-0.091***	-0.074***	-0.004
	(0.012)	(0.013)	(0.013)	(0.024)	(0.046)
Expected Spending Growth		0.073**	0.061**	0.128**	0.008
		(0.029)	(0.029)	(0.060)	(0.097)
Harder to obtain credit than year ago	0.079	0.062	-0.119	-0.586	-0.051
	(0.476)	(0.475)	(0.483)	(1.050)	(1.719)
Harder to obtain credit than one year from now	-1.173**	-1.207**	-1.337***	-0.307	-0.208
	(0.478)	(0.478)	(0.478)	(1.031)	(1.473)
Percent chance of higher avg US stock prices in 12mths	0.055***	0.055***	0.055***	0.036***	-0.004
	(0.007)	(0.007)	(0.007)	(0.014)	(0.030)
Percent chance of higher US unemployment rate in 12mths	0.006	0.005	0.008	0.003	-0.010
	(0.007)	(0.007)	(0.007)	(0.013)	(0.025)
Controls	✓	✓	✓	✓	✓
Year Dummies			✓	✓	
Net liquid wealth over income				✓	✓
Individual Fixed Effects					✓
Dep. Var. Mean	16.660	16.663	16.663	15.991	16.067
Adj. R-Squared	0.023	0.024	0.026	0.020	0.380
Observations	17,197	17,194	17,194	4,093	2,561

Note: Robust standard errors are included in parentheses and are clustered at the individual level in column 5. Time period: 2015-2023 for columns 1-3 and 2015-2020 for columns 4 and 5. Spending growth uncertainty is measured as the standard deviation of an individual's density forecast for year-ahead spending growth. Sample only includes employed individuals. Controls include log household income and dummy variables for college education, part time work status, self-employment status, marital status, white vs non-white, gender, and age groups (25-34,35-50,51-65). Net liquid wealth over income is winsorized at the 5th and 95th percentile and available only until 2020. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

B.8 Alternative MPC definitions

Table B.22: MPC and Earnings Uncertainty: Fuster et al. (2020)

	(1)	(2)	(3)	(4)
Earnings growth uncertainty	1.177	0.772	0.774	0.668
	(0.793)	(0.759)	(0.761)	(1.060)
Uncertainty squared	-0.069	-0.048	-0.048	-0.035
	(0.067)	(0.065)	(0.065)	(0.110)
Expected earnings growth		0.407**	0.408**	0.341*
		(0.181)	(0.180)	(0.190)
Controls	✓	✓	✓	✓
Year Dummies			✓	✓
Net Liquid wealth over income				✓
Dep. Var. Mean	9.800	9.800	9.800	9.641
Adj. R-Squared	0.004	0.008	0.007	-0.006
Observations	1,119	1,119	1,119	923

Note: Standard errors are robust and in parentheses. Time period: 2016-2017. Earnings growth uncertainty is measured as the standard deviation of an individual's density forecast for year-ahead earnings growth. MPCs are from Fuster et al. (2020), as detailed in the main text. Sample only includes employed individuals. Controls include log household income and dummy variables for college education, part time work status, self-employment status, marital status, white vs non-white, gender, and age groups (25-34,35-50,51-65). Liquid wealth over income is winsorized at the 5th and 95th percentile. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B.23: MPC and Spending Uncertainty: Fuster et al. (2020)

	(1)	(2)	(3)	(4)
Spending growth uncertainty	0.192	-0.040	-0.044	0.235
	(0.681)	(0.747)	(0.755)	(0.775)
Uncertainty squared	-0.006	0.005	0.005	-0.006
	(0.049)	(0.052)	(0.052)	(0.055)
Expected spending growth		0.187	0.186	0.214
		(0.185)	(0.185)	(0.198)
Controls	✓	✓	✓	✓
Year Dummies			✓	✓
Net Liquid wealth over income				✓
Dep. Var. Mean	9.895	9.895	9.895	9.637
Adj. R-Squared	-0.001	-0.001	-0.002	-0.006
Observations	778	778	778	693

Note: Standard errors are robust and in parentheses. Time period: 2016-2017. Spending growth uncertainty is measured as the standard deviation of an individual's density forecast for year-ahead spending growth. MPCs are from Fuster et al. (2020), as detailed in the main text. Sample only includes employed individuals. Controls include log household income and dummy variables for college education, part time work status, self-employment status, marital status, white vs non-white, gender, and age groups (25-34,35-50,51-65). Liquid wealth over income is winsorized at the 5th and 95th percentile. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B.24: MPC and Earnings Uncertainty: Special Survey (alternative MPC)

	(1)	(2)	(3)
Earnings growth uncertainty	3.691**	3.678**	3.664**
	(1.550)	(1.574)	(1.572)
Uncertainty squared	-0.159	-0.159	-0.156
	(0.116)	(0.116)	(0.115)
Expected earnings growth		0.043	0.016
		(0.389)	(0.386)
Controls	✓	✓	✓
Net Liquid wealth over income			✓
Dep. Var. Mean	15.506	15.506	15.506
Adj. R-Squared	0.129	0.124	0.119
Observations	168	168	168

Note: Standard errors are robust and in parentheses. Time period: 2023. Earnings growth uncertainty is measured as the standard deviation of an individual's density forecast for year-ahead earnings growth. Sample only includes employed individuals. Controls include log household income and dummy variables for college education, part time work status, self-employment status, marital status, white vs non-white, gender, and age groups (25-34,35-50,51-65). Liquid wealth over income is winsorized at the 5th and 95th percentile. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B.25: MPC and Spending Uncertainty: Special Survey (alternative MPC)

	(1)	(2)	(3)
Spending growth uncertainty	3.027**	4.669***	4.871***
	(1.389)	(1.548)	(1.536)
Uncertainty squared	-0.133	-0.234**	-0.242**
	(0.095)	(0.095)	(0.096)
Expected spending growth		-0.685**	-0.703**
		(0.275)	(0.276)
Controls	✓	✓	✓
Net Liquid wealth over income			✓
Dep. Var. Mean	15.521	15.521	15.521
Adj. R-Squared	0.068	0.107	0.106
Observations	144	144	144

Note: Standard errors are robust and in parentheses. Time period: 2023. Spending growth uncertainty is measured as the standard deviation of an individual's density forecast for year-ahead spending growth. Sample only includes employed individuals. Controls include log household income and dummy variables for college education, part time work status, self-employment status, marital status, white vs non-white, gender, and age groups (25-34,35-50,51-65). Liquid wealth over income is winsorized at the 5th and 95th percentile. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

B.9 Preference heterogeneity

Table B.26: MPC and Earnings Uncertainty with Risk Aversion

	(1)	(2)	(3)	(4)
Earnings Growth Uncertainty	0.802***	0.852***	0.806***	0.771**
	(0.171)	(0.183)	(0.183)	(0.348)
Uncertainty squared	-0.076***	-0.080***	-0.076***	-0.073***
	(0.014)	(0.015)	(0.015)	(0.025)
Expected Earnings Growth		-0.036	-0.036	-0.163**
		(0.039)	(0.039)	(0.081)
Middle Risk Aversion	1.172***	1.153***	1.106***	1.141
	(0.403)	(0.403)	(0.403)	(0.808)
High Risk Aversion	1.501***	1.481***	1.496***	2.971***
	(0.463)	(0.464)	(0.464)	(0.914)
Controls	✓	✓	✓	✓
Year Dummies			✓	✓
Net liquid wealth over income				✓
Dep. Var. Mean	16.681	16.681	16.681	16.043
Adj. R-Squared	0.018	0.018	0.019	0.018
Observations	16,623	16,623	16,623	3,765

Note: Standard errors are robust and in parentheses. Time period: 2015-2023 for columns 1-3 and 2016-2020 for column 4. Sample only includes employed individuals. Controls include log household income and dummy variables for college education, part time work status, self-employment status, marital status, white vs non-white, gender, and age groups (25-34,35-50,51-65). Net liquid wealth over income is winsorized at the 5th and 95th percentile and available only until 2020. (Inverse) Risk Aversion is a categorical scale variable on willingness to take risks in daily activities. Since it is measured once per individual, we do cannot estimate column (V) with individual fixed effects. We define "high risk aversion" as 1,2 on the scale, "middle risk aversion" as 3,4 on the scale, and "low risk aversion" as 5,6,7 on the scale. We leave out the "low risk aversion" group in the regression. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B.27: MPC and Spending Uncertainty with Risk Aversion

	(1)	(2)	(3)	(4)
Spending Growth Uncertainty	1.080***	1.208***	1.166***	0.810***
	(0.149)	(0.163)	(0.163)	(0.313)
Uncertainty squared	-0.076***	-0.095***	-0.093***	-0.069***
	(0.012)	(0.013)	(0.013)	(0.024)
Expected Spending Growth		0.064**	0.055*	0.145**
		(0.029)	(0.030)	(0.064)
Middle Risk Aversion	1.240***	1.249***	1.211***	1.217
	(0.402)	(0.402)	(0.402)	(0.804)
High Risk Aversion	1.519***	1.497***	1.511***	2.993***
	(0.461)	(0.461)	(0.461)	(0.910)
Controls	✓	✓	✓	✓
Year Dummies			✓	✓
Net liquid wealth over income				✓
Dep. Var. Mean	16.695	16.698	16.698	16.034
Adj. R-Squared	0.020	0.021	0.022	0.020
Observations	16,648	16,645	16,645	3,773

Note: Standard errors are robust and in parentheses. Time period: 2015-2023 for columns 1-3 and 2016-2020 for column 4. Sample only includes employed individuals. Controls include log household income and dummy variables for college education, part time work status, self-employment status, marital status, white vs non-white, gender, and age groups (25-34,35-50,51-65). Net liquid wealth over income is winsorized at the 5th and 95th percentile and available only until 2020. (Inverse) Risk Aversion is a categorical scale variable on willingness to take risks in daily activities. Since it is measured once per individual, we do cannot estimate column (V) with individual fixed effects. We define "high risk aversion" as 1,2 on the scale, "middle risk aversion" as 3,4 on the scale, and "low risk aversion" as 5,6,7 on the scale. We leave out the "low risk aversion" group in the regression. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B.28: MPC and Earnings Uncertainty by Risk aversion

	(1)	(2)	(3)
Panel A			
Earnings Growth Uncertainty	-0.131	0.132	-0.047
	(0.114)	(0.109)	(0.144)
Panel B			
Earnings Growth Uncertainty	-0.127	0.128	-0.061
	(0.123)	(0.110)	(0.146)
Expected Earnings Growth	-0.006	0.013	0.042
	(0.062)	(0.060)	(0.080)
Panel C			
Earnings Growth Uncertainty	0.277	1.004***	1.208***
	(0.315)	(0.285)	(0.381)
Uncertainty squared	-0.036	-0.082***	-0.121***
	(0.023)	(0.024)	(0.031)
Expected Earnings Growth	-0.027	-0.029	-0.020
	(0.065)	(0.064)	(0.084)
Controls	✓	✓	✓
Year Dummies	✓	✓	✓
Risk Aversion	Low	Middle	High
Dep. Var. Mean	15.88	16.96	17.21
Adj. R-Squared	0.020	0.019	0.029
Observations	5,276	6,896	4,451

Note: Standard errors are robust and in parentheses. Time period: 2015-2023. Sample only includes employed individuals. Controls include log household income and dummy variables for college education, part time work status, self-employment status, marital status, white vs non-white, gender, and age groups (25-34,35-50,51-65). (Inverse) Risk Aversion is a categorical scale variable on willingness to take risks in daily activities. We define ”high risk aversion” as 1,2 on the scale, ”middle risk aversion” as 3,4 on the scale, and “low risk aversion” as 5,6,7 on the scale. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B.29: MPC and Spending Uncertainty by Risk aversion

	(1)	(2)	(3)
Panel A			
Spending Growth Uncertainty	0.278**	0.220**	0.142
	(0.115)	(0.093)	(0.129)
Panel B			
Spending Growth Uncertainty	0.219*	0.201**	0.087
	(0.119)	(0.095)	(0.133)
Expected Spending Growth	0.168***	0.057	0.063
	(0.050)	(0.047)	(0.054)
Panel C			
Spending Growth Uncertainty	1.383***	1.067***	1.205***
	(0.290)	(0.245)	(0.321)
Uncertainty squared	-0.109***	-0.077***	-0.108***
	(0.024)	(0.020)	(0.027)
Expected Spending Growth	0.129**	0.019	0.036
	(0.052)	(0.049)	(0.054)
Controls	✓	✓	✓
Year Dummies	✓	✓	✓
Risk Aversion	Low	Middle	High
Dep. Var. Mean	15.86	17.01	17.21
Adj. R-Squared	0.025	0.020	0.030
Observations	5,290	6,896	4,459

Note: Standard errors are robust and in parentheses. Time period: 2015-2023. Sample only includes employed individuals. Controls include log household income and dummy variables for college education, part time work status, self-employment status, marital status, white vs non-white, gender, and age groups (25-34,35-50,51-65). (Inverse) Risk Aversion is a categorical scale variable on willingness to take risks in daily activities. We define "high risk aversion" as 1,2 on the scale, "middle risk aversion" as 3,4 on the scale, and "low risk aversion" as 5,6,7 on the scale. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B.30: MPC and Earnings Uncertainty with Patience

	(1)	(2)	(3)	(4)
Earnings Growth Uncertainty	0.703***	0.873***	0.809***	0.627
	(0.206)	(0.223)	(0.224)	(0.403)
Uncertainty squared	-0.078***	-0.089***	-0.084***	-0.068**
	(0.016)	(0.017)	(0.017)	(0.030)
Expected Earnings Growth		-0.124**	-0.122**	-0.152*
		(0.050)	(0.050)	(0.091)
Medium Patience	-1.393*	-1.371*	-1.465*	-1.673
	(0.771)	(0.771)	(0.771)	(1.334)
High Patience	-1.886***	-1.845**	-2.044***	-2.132*
	(0.719)	(0.719)	(0.719)	(1.246)
Controls	✓	✓	✓	✓
Year Dummies			✓	✓
Net liquid wealth over income				✓
Dep. Var. Mean	16.838	16.838	16.838	15.967
Adj. R-Squared	0.018	0.018	0.020	0.014
Observations	10,819	10,819	10,819	2,969

Note: Standard errors are robust and in parentheses. Time period: 2016-2023 for columns 1-3 and 2017-2020 for column 4. Sample only includes employed individuals. Controls include log household income and dummy variables for college education, part time work status, self-employment status, marital status, white vs non-white, gender, and age groups (25-34,35-50,51-65). Net liquid wealth over income is winsorized at the 5th and 95th percentile and available only until 2020. Patience is a categorical scale variable on whether the respondent, in comparison to others, is a person who is generally willing to give up something today in order to benefit in the future. Since it is measured once per individual, we cannot estimate column (V) with individual fixed effects. We define "low patience" as 1–4 on the scale, "medium patience" as 5–6, and "high patience" as 7–10. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B.31: MPC and Spending Uncertainty with Patience

	(1)	(2)	(3)	(4)
Spending Growth Uncertainty	1.100***	1.334***	1.272***	1.139***
	(0.200)	(0.201)	(0.200)	(0.350)
Uncertainty squared	-0.084***	-0.112***	-0.109***	-0.108***
	(0.017)	(0.016)	(0.016)	(0.026)
Expected Spending Growth		0.041	0.027	0.179**
		(0.037)	(0.037)	(0.073)
Medium Patience	-1.336*	-1.348*	-1.439*	-1.893
	(0.776)	(0.776)	(0.777)	(1.335)
High Patience	-1.878***	-1.912***	-2.090***	-2.447*
	(0.723)	(0.723)	(0.724)	(1.249)
Controls	✓	✓	✓	✓
Year Dummies			✓	✓
Net liquid wealth over income				✓
Dep. Var. Mean	16.857	16.861	16.861	15.961
Adj. R-Squared	0.020	0.021	0.022	0.019
Observations	10,836	10,834	10,834	2,976

Note: Standard errors are robust and in parentheses. Time period: 2016-2023 for columns 1-3 and 2017-2020 for column 4. Sample only includes employed individuals. Controls include log household income and dummy variables for college education, part time work status, self-employment status, marital status, white vs non-white, gender, and age groups (25-34,35-50,51-65). Net liquid wealth over income is winsorized at the 5th and 95th percentile and available only until 2020. Patience is a categorical scale variable on whether the respondent, in comparison to others, is a person who is generally willing to give up something today in order to benefit in the future. Since it is measured once per individual, we cannot estimate column (V) with individual fixed effects. We define "low patience" as 1–4 on the scale, "medium patience" as 5–6, and "high patience" as 7–10. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B.32: MPC and Earnings Uncertainty by degrees of Patience

	(1)	(2)	(3)
Panel A			
Earnings Growth Uncertainty	-0.272	-0.144	-0.059
	(0.213)	(0.154)	(0.116)
Panel B			
Earnings Growth Uncertainty	-0.268	-0.127	0.001
	(0.214)	(0.158)	(0.126)
Expected Earnings Growth	-0.052	-0.055	-0.095
	(0.164)	(0.092)	(0.061)
Panel C			
Earnings Growth Uncertainty	1.477**	1.136**	0.525*
	(0.637)	(0.461)	(0.279)
Uncertainty squared	-0.156***	-0.114***	-0.050**
	(0.048)	(0.035)	(0.021)
Expected Earnings Growth	-0.107	-0.145	-0.116*
	(0.169)	(0.100)	(0.062)
Controls	✓	✓	✓
Year Dummies	✓	✓	✓
Patience	Low	Medium	High
Dep. Var. Mean	18.09	16.60	16.70
Adj. R-Squared	0.036	0.016	0.019
Observations	1,269	2,674	6,876

Note: Standard errors are robust and in parentheses. Time period: 2016-2023. Sample only includes employed individuals. Controls include log household income and dummy variables for college education, part time work status, self-employment status, marital status, white vs non-white, gender, and age groups (25-34,35-50,51-65). Patience is a categorical scale variable on whether the respondent, in comparison to others, is a person who is generally willing to give up something today in order to benefit in the future. We define "low patience" as 1–4 on the scale, "medium patience" as 5–6, and "high patience" as 7–10. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B.33: MPC and Spending Uncertainty by degrees of Patience

	(1)	(2)	(3)
Panel A			
Spending Growth Uncertainty	-0.110	0.114	0.221**
	(0.205)	(0.146)	(0.100)
Panel B			
Spending Growth Uncertainty	-0.060	0.082	0.169
	(0.218)	(0.153)	(0.104)
Expected Spending Growth	-0.082	0.119	0.086*
	(0.106)	(0.075)	(0.045)
Panel C			
Spending Growth Uncertainty	0.840	1.260***	1.378***
	(0.653)	(0.373)	(0.237)
Uncertainty squared	-0.080	-0.107***	-0.115***
	(0.055)	(0.026)	(0.018)
Expected Spending Growth	-0.109	0.073	0.042
	(0.108)	(0.077)	(0.046)
Controls	✓	✓	✓
Year Dummies	✓	✓	✓
Patience	Low	Medium	High
Dep. Var. Mean	18.18	16.64	16.70
Adj. R-Squared	0.031	0.018	0.022
Observations	1,269	2,670	6,895

Note: Standard errors are robust and in parentheses. Time period: 2016-2023. Sample only includes employed individuals. Controls include log household income and dummy variables for college education, part time work status, self-employment status, marital status, white vs non-white, gender, and age groups (25-34,35-50,51-65). Patience is a categorical scale variable on whether the respondent, in comparison to others, is a person who is generally willing to give up something today in order to benefit in the future. We define "low patience" as 1–4 on the scale, "medium patience" as 5–6, and "high patience" as 7–10. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

B.10 Results by wealth quartiles

Table B.34: MPC and Earnings Uncertainty by Net Liquid Wealth Quartiles

	(1)	(2)	(3)	(4)
Panel A				
Earnings Growth Uncertainty	-0.036	-0.257	0.131	0.562
	(0.229)	(0.189)	(0.338)	(0.431)
Panel B				
Earnings Growth Uncertainty	-0.005	-0.261	0.232	0.653
	(0.234)	(0.191)	(0.341)	(0.458)
Expected Earnings Growth	-0.066	0.016	-0.165	-0.170
	(0.129)	(0.140)	(0.180)	(0.178)
Panel C				
Earnings Growth Uncertainty	1.307**	0.277	0.932	0.662
	(0.593)	(0.558)	(0.923)	(1.084)
Uncertainty squared	-0.118***	-0.042	-0.068	-0.001
	(0.040)	(0.036)	(0.082)	(0.129)
Expected Earnings Growth	-0.134	-0.016	-0.211	-0.170
	(0.139)	(0.146)	(0.191)	(0.175)
Controls	✓	✓	✓	✓
Year Dummies	✓	✓	✓	✓
Quartile	1	2	3	4
Dep. Var. Mean	12.95	15.95	17.59	17.65
Adj. R-Squared	0.008	0.004	0.018	0.020
Observations	1,029	1,024	1,025	1,010

Note: Standard errors are robust and in parentheses. Time period: 2015-2020. Sample only includes employed individuals. Controls include log household income and dummy variables for college education, part time work status, self-employment status, marital status, white vs non-white, gender, and age groups (25-34,35-50,51-65). * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B.35: MPC and Spending Uncertainty by Net Liquid Wealth Quartiles

	(1)	(2)	(3)	(4)
Panel A				
Spending Growth Uncertainty	0.206	-0.105	0.374	0.284
	(0.215)	(0.196)	(0.284)	(0.365)
Panel B				
Spending Growth Uncertainty	0.077	-0.133	0.148	0.337
	(0.224)	(0.193)	(0.280)	(0.407)
Expected Spending Growth	0.168*	0.112	0.410***	-0.053
	(0.094)	(0.110)	(0.125)	(0.154)
Panel C				
Spending Growth Uncertainty	1.222**	0.228	0.572	4.114***
	(0.523)	(0.525)	(0.642)	(1.235)
Uncertainty squared	-0.105***	-0.030	-0.039	-0.492***
	(0.038)	(0.039)	(0.049)	(0.159)
Expected Spending Growth	0.138	0.097	0.403***	-0.051
	(0.094)	(0.112)	(0.125)	(0.158)
Controls	✓	✓	✓	✓
Year Dummies	✓	✓	✓	✓
Quartile	1	2	3	4
Dep. Var. Mean	12.86	16.14	17.46	17.63
Adj. R-Squared	0.012	0.004	0.027	0.029
Observations	1,030	1,053	994	1,019

Note: Standard errors are robust and in parentheses. Time period: 2015-2020. Sample only includes employed individuals. Controls include log household income and dummy variables for college education, part time work status, self-employment status, marital status, white vs non-white, gender, and age groups (25-34,35-50,51-65). * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

B.11 Results by age

Table B.36: MPC and Earnings Uncertainty by Age Groups

	(1)	(2)	(3)
Earnings Growth Uncertainty	1.449***	0.389	0.905**
	(0.373)	(0.260)	(0.429)
Uncertainty squared	-0.147***	-0.063***	-0.070*
	(0.031)	(0.019)	(0.037)
Expected Earnings Growth	-0.183**	-0.073	0.246**
	(0.076)	(0.058)	(0.098)
Controls	✓	✓	✓
Year Dummies	✓	✓	✓
Age Group	25-34	35-50	51-65
Dep. Var. Mean	16.476	16.362	16.394
Adj. R-Squared	0.016	0.017	0.029
Observations	3,917	7,021	4,568

Note: Standard errors are robust and in parentheses. Time period: 2015-2023. Sample only includes employed individuals. Controls include log household income and dummy variables for college education, part time work status, self-employment status, marital status, white vs non-white, gender. Age groups are 25-34, 35-50, 51-65. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B.37: MPC and Spending Uncertainty by Age Groups

	(1)	(2)	(3)
Spending Growth Uncertainty	2.242***	0.936***	0.796**
	(0.343)	(0.247)	(0.333)
Uncertainty squared	-0.189***	-0.080***	-0.076***
	(0.031)	(0.020)	(0.029)
Expected Spending Growth	0.026	0.103**	0.044
	(0.063)	(0.045)	(0.054)
Controls	✓	✓	✓
Year Dummies	✓	✓	✓
Age Group	25-34	35-50	51-65
Dep. Var. Mean	16.481	16.365	16.378
Adj. R-Squared	0.022	0.018	0.027
Observations	3,923	7,020	4,578

Note: Standard errors are robust and in parentheses. Time period: 2015-2023. Sample only includes employed individuals. Controls include log household income and dummy variables for college education, part time work status, self-employment status, marital status, white vs non-white, gender. Age groups are 25-34, 35-50, 51-65. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

B.12 First-difference regressions

Table B.38: MPC and Earnings Uncertainty: First Differences

	(1)	(2)	(3)	(4)	(5)
Panel A					
[Δ] Earnings Growth Uncertainty	-0.118	-0.120	-0.094	-0.093	-0.185
	(0.129)	(0.129)	(0.134)	(0.134)	(0.223)
[Δ] Expected Earnings Growth			-0.039	-0.041	-0.045
			(0.058)	(0.058)	(0.097)
Panel B					
[Δ] Earnings Growth Uncertainty	-0.111	-0.128	-0.076	-0.073	0.061
	(0.271)	(0.271)	(0.283)	(0.284)	(0.504)
[Δ] Uncertainty squared	-0.001	0.001	-0.002	-0.002	-0.025
	(0.021)	(0.021)	(0.021)	(0.021)	(0.039)
[Δ] Expected Earnings Growth			-0.039	-0.041	-0.052
			(0.058)	(0.058)	(0.100)
Dep. Var. Mean	-0.317	-0.305	-0.305	-0.305	-0.0757
Adj. R-Squared	-0.000	0.000	0.000	0.000	-0.001
Observations	8,903	8,897	8,897	8,897	2,985
Controls	✓				
FD Controls		✓	✓	✓	✓
Year Dummies				✓	✓
Net liquid wealth over income					✓

Note: Robust standard errors are included in parentheses. Time period: 2015-2023 for columns 1-4 and 2015-2020 for column 5. Earnings growth uncertainty is measured as the standard deviation of an individual's density forecast for year-ahead earnings growth. Uncertainty, its square, expected earnings growth, and the MPC are in first differences. Sample only includes employed individuals. Controls include log household income and dummy variables for college education, part time work status, self-employment status, marital status, white vs non-white, gender, and age groups (25-34,35-50,51-65). Net liquid wealth over income is winsorized at the 5th and 95th percentile and available only until 2020. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B.39: MPC and Spending Uncertainty: First Differences

	(1)	(2)	(3)	(4)	(5)
Panel A					
[Δ] Spending Growth Uncertainty	0.189*	0.177	0.134	0.139	0.201
	(0.109)	(0.109)	(0.111)	(0.111)	(0.187)
[Δ] Expected Spending Growth			0.076*	0.073*	-0.045
			(0.041)	(0.041)	(0.067)
Panel B					
[Δ] Spending Growth Uncertainty	0.568***	0.542***	0.343	0.344	0.239
	(0.201)	(0.204)	(0.221)	(0.221)	(0.363)
[Δ] Uncertainty squared	-0.035**	-0.033**	-0.020	-0.020	-0.004
	(0.014)	(0.015)	(0.017)	(0.017)	(0.026)
[Δ] Expected Spending Growth			0.071*	0.068*	-0.045
			(0.041)	(0.041)	(0.067)
Dep. Var. Mean	-0.326	-0.344	-0.338	-0.338	-0.157
Adj. R-Squared	0.001	0.001	0.001	0.001	-0.001
Observations	9,009	8,914	8,912	8,912	2,995
Controls	✓				
FD Controls		✓	✓	✓	✓
Year Dummies				✓	✓
Net liquid wealth over income					✓

Note: Robust standard errors are included in parentheses. Time period: 2015-2023 for columns 1-4 and 2015-2020 for column 5. Spending growth uncertainty is measured as the standard deviation of an individual's density forecast for year-ahead spending growth. Uncertainty, its square, expected spending growth, and the MPC are in first differences. Sample only includes employed individuals. Controls include log household income and dummy variables for college education, part time work status, self-employment status, marital status, white vs non-white, gender, and age groups (25-34,35-50,51-65). Net liquid wealth over income is winsorized at the 5th and 95th percentile and available only until 2020. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

B.13 Uncertainty scenarios

Table B.40: MPC and Earnings Uncertainty: Hypothetical Scenarios

	(1)	(2)	(3)	(4)	(5)
Panel A					
[Δ] Earnings Growth Uncertainty	-0.211*	-0.214	-0.217	-0.212	-0.286
	(0.111)	(0.149)	(0.148)	(0.155)	(0.190)
Expected Earnings Growth			0.011	0.015	0.015
			(0.049)	(0.053)	(0.053)
Panel B					
[Δ] Earnings Growth Uncertainty	-0.162	-0.169	-0.212	-0.180	-0.187
	(0.194)	(0.226)	(0.224)	(0.233)	(0.238)
[Δ] Uncertainty squared	-0.010	-0.009	-0.001	-0.007	-0.027
	(0.033)	(0.034)	(0.033)	(0.035)	(0.039)
Expected Earnings Growth			0.011	0.015	0.016
			(0.049)	(0.053)	(0.053)
Dep. Var. Mean	-0.288	-0.288	-0.274	-0.205	-0.205
Adj. R-Squared	0.000	-0.000	-0.000	-0.001	-0.001
Observations	5,243	5,195	5,140	4,722	4,722
Controls		✓	✓	✓	✓
Net liquid wealth over income				✓	✓
Survey Dummies					✓

Note: Robust standard errors are included in parentheses and are clustered at the individual level in column 5. Data is from three survey waves: November 2023, March 2024, July 2024, and November 2024. The dependent variable in the regressions is the within-individual difference in MPCs elicited across scenarios. Earnings growth uncertainty and it's square are also included as differences in the regressions. Earnings growth uncertainty is defined in Appendix A, together with a description of these special questions. Sample only includes employed individuals. Controls include log household income and dummy variables for college education, part time work status, self-employment status, marital status, white vs non-white, gender, and age groups (25-34,35-50,51-65). Net liquid wealth over income is winsorized at the 5th and 95th percentile. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

C Additional results: quantitative model

C.1 Baseline model

Table C.1: MPC and Earnings Uncertainty in the model

	(1)	(2)	(3)	(4)
Panel A				
Earnings growth uncertainty	-2.960***	-2.929***	-3.365***	-7.415***
	(0.033)	(0.046)	(0.033)	(0.099)
Panel B				
Earnings growth uncertainty	-9.567***	-9.498***	-9.586***	-9.535***
	(0.111)	(0.111)	(0.109)	(0.109)
Uncertainty squared	0.722***	0.781***	0.682***	1.130***
	(0.012)	(0.012)	(0.011)	(0.026)
Expected earnings growth			✓	✓
Wealth to income ratio		✓		✓
Log income				✓

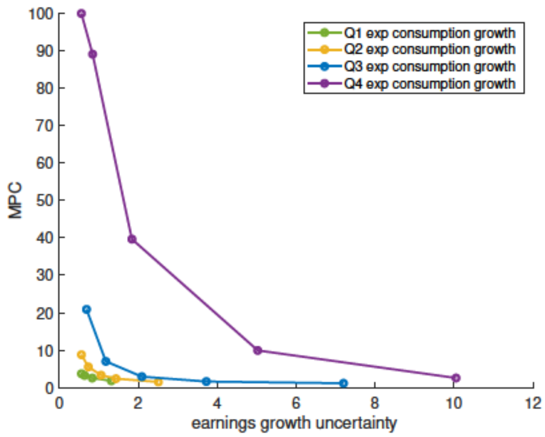
Note: Standard errors are robust and in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table C.2: MPC and Spending Uncertainty in the model

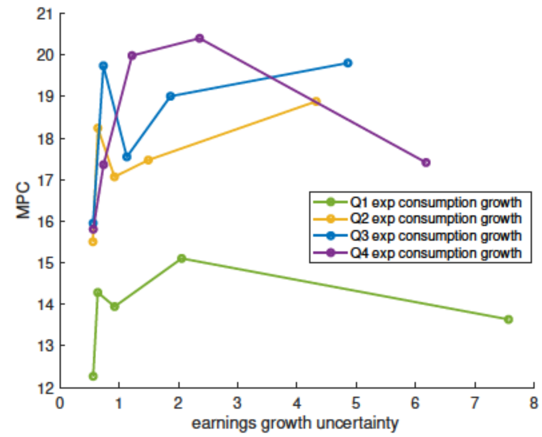
	(1)	(2)	(3)	(4)
Panel A				
Spending growth uncertainty	60.234***	61.685***	-43.274***	-44.385***
	(0.442)	(0.435)	(0.587)	(0.605)
Panel B				
Spending growth uncertainty	100.480***	104.515***	9.434***	9.463***
	(0.654)	(0.643)	(0.611)	(0.625)
Uncertainty squared	-20.273***	-21.518***	-37.147***	-37.234***
	(0.247)	(0.243)	(0.207)	(0.204)
Expected spending growth			✓	✓
Wealth to income ratio		✓		✓
Log income				✓

Note: Standard errors are robust and in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Figure C.1: MPC and earnings growth uncertainty by quartiles of expected spending growth



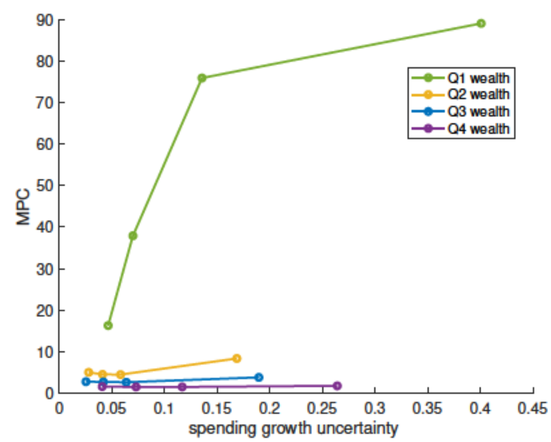
(a) Model



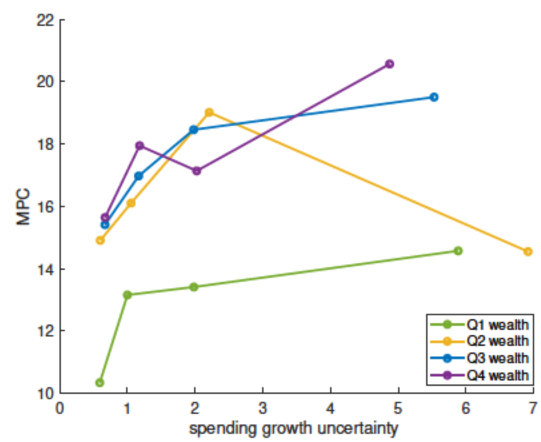
(b) Data

Notes. Left panel shows data simulated from the stationary distribution of the model. Households are grouped in four quartiles of the expected spending growth, from the lowest (Q1, in green) to the highest (Q4, in purple). For each quartile of expected spending growth, dots represent quantiles of earnings growth uncertainty. The right panel repeats the same analysis in the SCE data. In unreported results, we regress MPCs on earnings growth uncertainty (and its square) for each quartile of expected spending growth, and find an increasing and concave relationship for each quartile.

Figure C.2: MPC and spending growth uncertainty by wealth quartile



(a) Model



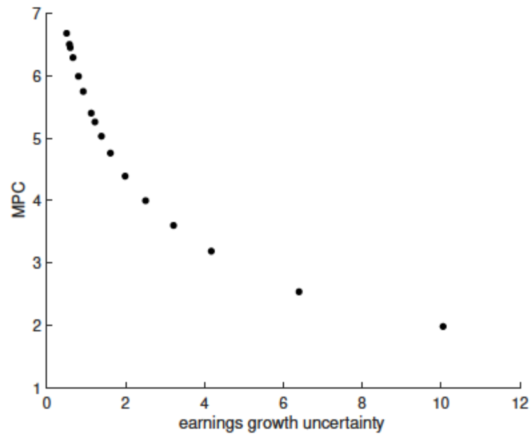
(b) Data

Note: Left panel shows data simulated from the stationary distribution of the model. Households are grouped in four quartiles of wealth (a), from the lowest (Q1, in green) to the highest (Q4, in purple). For each quartile of wealth, dots represent quantiles of spending growth uncertainty. The right panel repeats the same analysis in the SCE data, grouping households by quartiles of net liquid wealth.

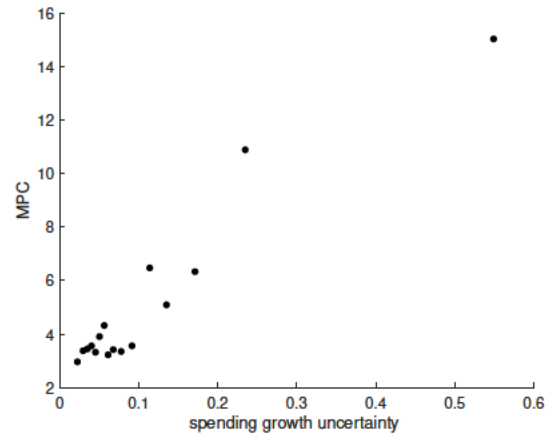
C.2 MPC out of 10% shocks

To align with convention in the literature, we have defined in the main text the MPC as $\frac{c_i(a_i+x,y_i)-c_i(a_i,y_i)}{x}$, where x is arbitrarily small. In this section, we show that our results are qualitatively unaffected if we assume that the size of the windfall, x, is equal to 10%

Figure C.3: MPC and uncertainty: alternative MPCs



(a) Earnings uncertainty

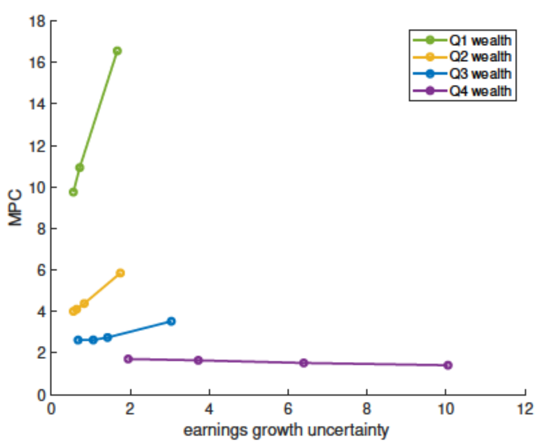


(b) Spending uncertainty

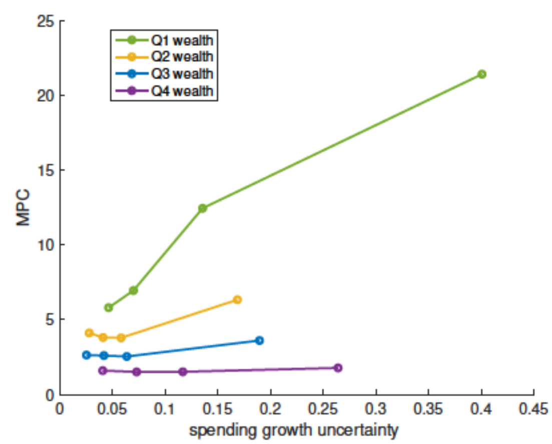
of household's current income. This approach has the advantage of aligning more closely with the question in the SCE data. However, it potentially introduces a few confounding factors. First, it lowers the MPC, as we consider the consumption sensitivity to relatively large shocks. Second, it implies that the size of the shock depends on current income, and thus also potentially correlates with risk heterogeneity.

Nevertheless, our conclusions are unaffected, as we show in Figure C.3 and C.4. MPCs fall with earnings growth uncertainty and increase with spending growth uncertainty. Also note that using these alternative MPCs does not change any of the conclusions in each of the robustness exercises discussed in the following Appendix subsections.

Figure C.4: MPC and uncertainty by wealth quartile: alternative MPCs

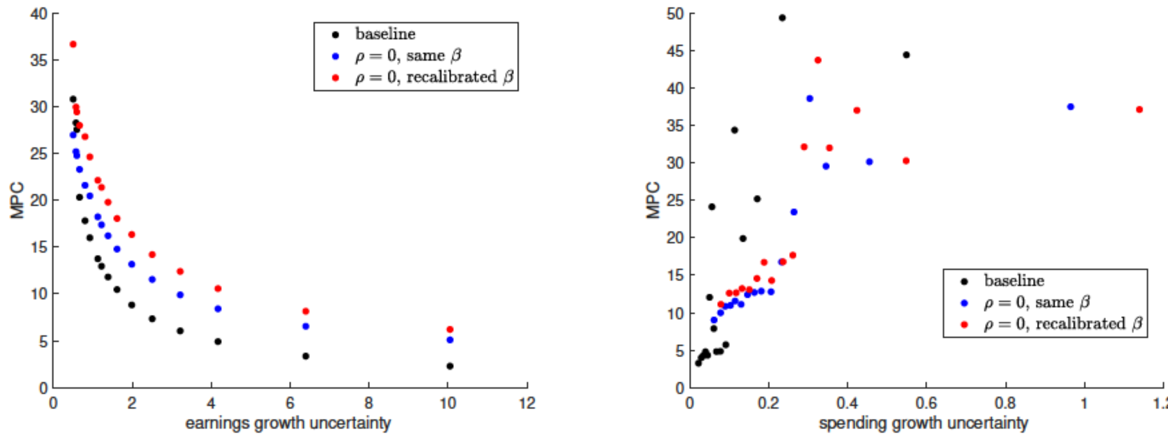


(a) Earnings uncertainty



(b) Spending uncertainty

Figure C.5: MPC and uncertainty: income persistence



(a) Earnings uncertainty (b) Spending uncertainty

Note: Data simulated from the stationary distribution of three versions of the baseline model. In black, the baseline model with parameterization described in Section 5. In blue, a model in which $\rho = 0$ and all other parameters are unchanged. In red, $\rho = 0$ and $\beta = 0.9897$ is recalibrated to match the share of hand-to-mouth households. In the left panel, the dots are associated with the 16 quantile values of σ as described in the text: for each of them, we compute the average MPC displayed on the vertical axis. In the right panel, we classify simulated data in 20 quantiles of spending growth uncertainty and, again, compute the average MPC for each of them.

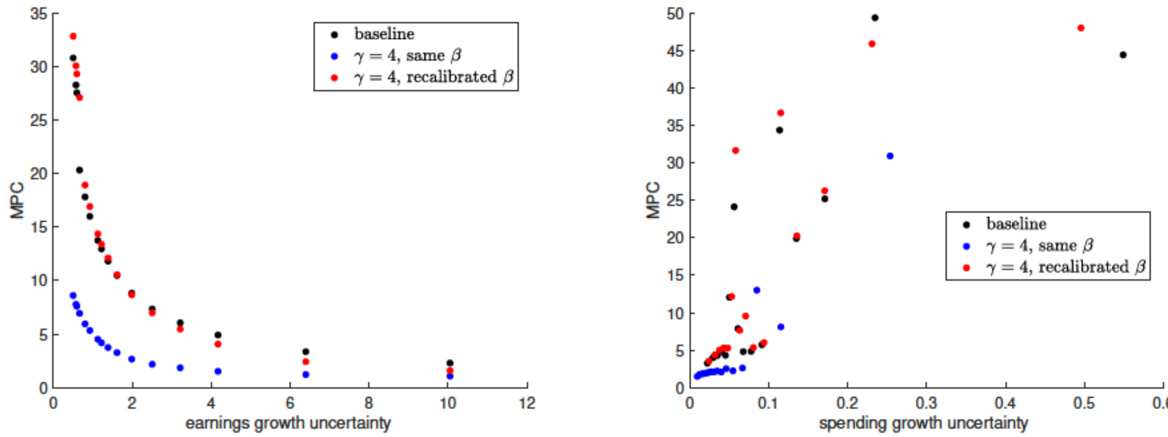
C.3 Alternative parameterizations

As a first sensitivity check, we show in Figure C.5a that the model predicts a negative relationship between MPCs and earnings growth uncertainty even when earnings are purely transitory, that is $\rho = 0$. In this setup, the incentive to save is weaker, especially for larger values of σ. As a result, uncertain households are less wealthy compared to the baseline and have relatively higher MPCs. On the other hand, a lower ρ also affects the concavity of the consumption function at a given level of wealth, and the extent to which households hit the borrowing constraint. For a given β, MPCs are slightly flatter in uncertainty, but still markedly declining (see blue dots). When we again lower β in order to match the share of hand-to-mouth households, MPCs are shifted up and, once again, they fall with earnings uncertainty (see red dots). The relationship between MPCs and spending growth uncertainty remains increasing for the different parameterizations, as showed in Figure C.5b.

Next, we show in Figure C.6 that our main conclusions are also unaffected with a higher risk aversion, γ. Higher values of γ strengthen the precautionary savings motive. This makes the consumption function more concave but, at the same time, pushes households away from the borrowing constraint. For a given β, MPCs are lower, but nevertheless still declining with earnings uncertainty. When we lower β in order to match again the share of hand-to-mouth households, MPCs are shifted up and, once again, they fall with earnings uncertainty.

These results also implicitly show that the model's prediction of MPCs falling with earn-

Figure C.6: MPC and uncertainty: risk aversion



(a) Earnings uncertainty

(b) Spending uncertainty

Note: Data simulated from the stationary distribution of three versions of the baseline model. In black, the baseline model with parameterization described in Section 5. In blue, a model in which $\gamma = 4$ and all other parameters are unchanged. In red, $\gamma = 4$ and $\beta = 0.9896276057$ is recalibrated to match the share of hand-to-mouth households. In the left panel, the dots are associated with the 16 quantile values of σ as described in the text: for each of them, we compute the average MPC displayed on the vertical axis. In the right panel, we classify simulated data in 20 quantiles of spending growth uncertainty and, again, compute the average MPC for each of them.

ings growth uncertainty is robust to the choice of the discount factor β. To visualize this even further, we compare results with a very low and very high β in Figure C.7. In either case, MPCs fall with earnings growth uncertainty. When β is very low, MPCs also counterfactually fall with spending growth uncertainty.

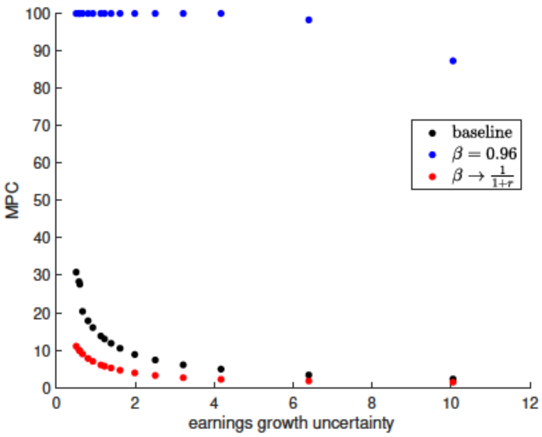
The level of the interest rate also does not affect our conclusions, as we show in Figure C.8.

Finally, we investigate whether different parameter combinations can generate a positive gradient between MPCs and σ. We consider $N_\gamma = 9$ values of the inverse elasticity of intertemporal substitution, ranging from $\gamma = 10$ to $\gamma = 0.4$, $N_\beta = 10$ values of the discount factor, ranging from $\beta = 0.96$ to $\beta = 0.99$, $N_\rho = 3$ values of persistence, ranging from $\rho = 0$ to $\rho = 0.904$, and $N_{\underline{a}} = 3$ values of the borrowing constraint, from the natural debt limit to 0. In all $\{N_\gamma \cdot N_\beta \cdot N_\rho \cdot N_{\underline{a}}\} = 810$ parameter combinations we explore, MPCs do not increase with earnings growth uncertainty.

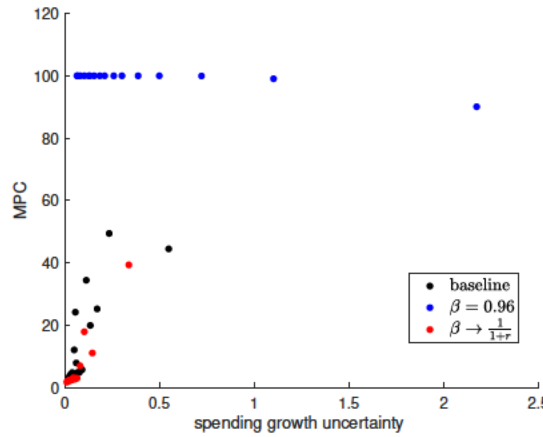
C.4 Endogenous labor supply

We allow for endogenous labor supply considering the following utility function: $U = \frac{c^{1-\gamma}-1}{1-\gamma} - \varphi \frac{n^{1+\frac{1}{\kappa}}}{1+\frac{1}{\kappa}}$. Hours worked are denoted by n, such that the budget constraint becomes $c + a' = yn + a(1+r)$. Earnings growth uncertainty, in the data, is conditional on working the same number of hours. As such, in the model it remains equal to the standard deviation of the

Figure C.7: MPC and uncertainty: discount factor



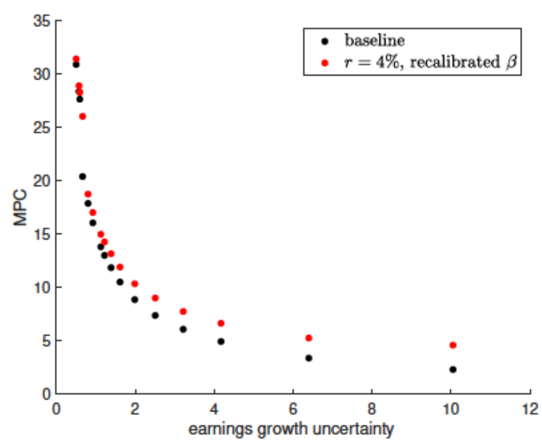
(a) Earnings uncertainty



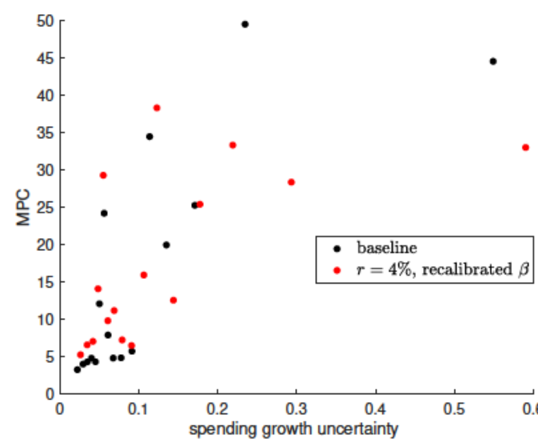
(b) Spending uncertainty

Note: Data simulated from the stationary distribution of three versions of the baseline model. In black, the baseline model with parameterization described in Section 5. In blue, a model in which $\beta = 0.96$ and all other parameters are unchanged. In red, $\beta = \frac{1}{1+r} - 0.0001 = 0.9900$. In the left panel, the dots are associated with the 16 quantile values of σ as described in the text: for each of them, we compute the average MPC displayed on the vertical axis. In the right panel, we classify simulated data in 20 quantiles of spending growth uncertainty and, again, compute the average MPC for each of them.

Figure C.8: MPC and uncertainty: interest rate



(a) Earnings uncertainty



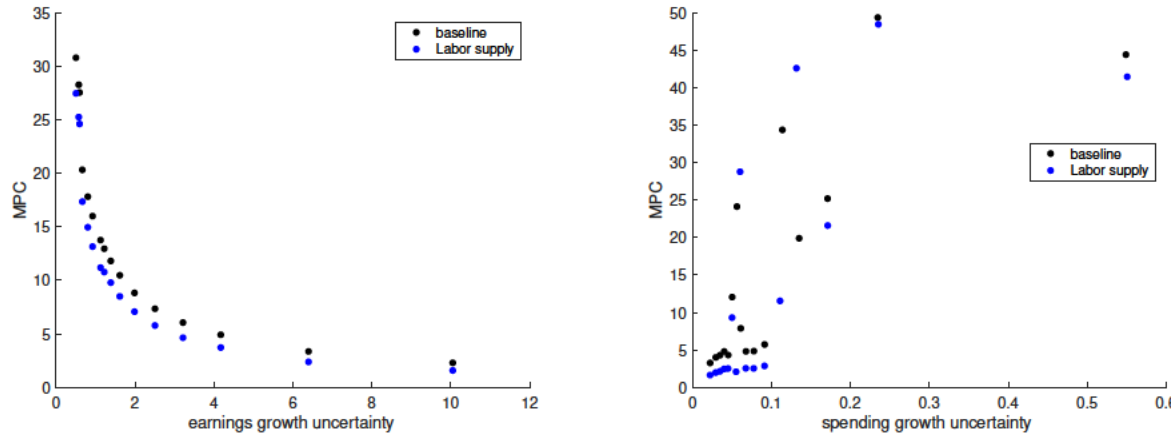
(b) Spending uncertainty

Note: Data simulated from the stationary distribution of two versions of the model. In black, the baseline model with parameterization described in Section 5. In red, a model in which $r = 0.04$, and β is recalibrated to match the share of hand-to-mouth households. In the left panel, the dots are associated with the 16 quantile values of σ as described in the text: for each of them, we compute the average MPC displayed on the vertical axis. In the right panel, we classify simulated data in 20 quantiles of spending growth uncertainty and, again, compute the average MPC for each of them.

innovations to the process for y: $VAR\left(\log\left(y_{t+1}n_{t+1}\right) - \log\left(y_t n_t\right) | \log\left(y_t n_t\right), n_{t+1} = n_t\right) = \sigma^2$.

We start by considering $\kappa = 1$ and report the results in Figure C.9. Since introducing endogenous labor supply with this choice of κ lowers the share of hand to mouth only

Figure C.9: MPC and uncertainty: labor supply



(a) Earnings uncertainty (b) Spending uncertainty

Note: Data simulated from the stationary distribution of two models. In black, the baseline model with parameterization described in Section 5. In blue, a model with endogenous labor supply. In the left panel, the dots are associated with the 16 quantile values of σ as described in the text: for each of them, we compute the average MPC displayed on the vertical axis. In the right panel, we classify simulated data in 20 quantiles of spending growth uncertainty and, again, compute the average MPC for each of them.

marginally, we show the results keeping β at the value calibrated in Section 5. Recalibrating β has a negligible impact. We also choose φ to normalize aggregate labor supply to 1. As in our baseline findings, MPCs fall with σ, whereas they increase with spending growth uncertainty.

We find qualitatively similar results for different values of κ, such as 10 or 0.5.

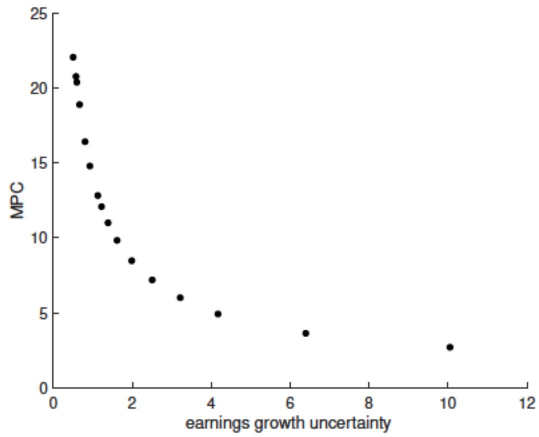
C.5 Interest rate schedule

In Figure C.10 we consider an extension of the model proposed by Koşar et al. (2023). Households are allowed to borrow up to their natural debt limit. However, they face a debt price schedule $q(a')$ such as the budget constraint becomes $c + q(a')a' = y + a$. For the functional form of the pricing schedule, we follow Koşar et al. (2023):

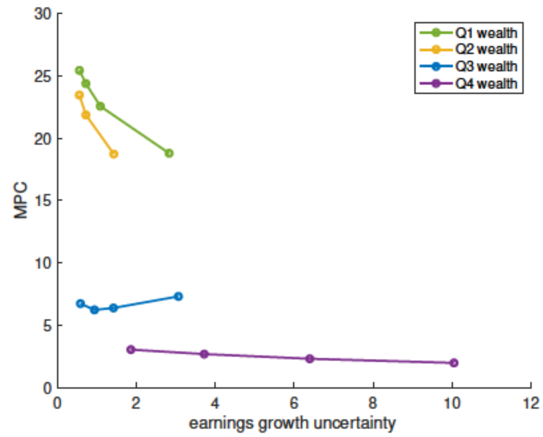
$$q = \begin{cases} \max\left[\frac{1}{1+r} - \phi_1 \left(-a'\right)^{\phi_2}, 0\right] & \text{if } a' \leq 0 \\ \frac{1}{1+r} & \text{if } a' > 0 \end{cases}$$

We calibrate $\beta = 0.9893$, $\phi_1 = 0.0146$ and $\phi_2 = 0.6$ to match three moments from the SCE, as in Koşar et al. (2023): (i) the share of households with negative net liquid assets, (ii) the MPC of households in the bottom quintile of net liquid wealth-to-income ratio, conditional on negative net liquid assets, and (iii) the MPC in the top quintile, also for negative asset holders.

Figure C.10: MPC and earnings growth uncertainty: debt repayment motives



(a) Full distribution



(b) Wealth quartiles

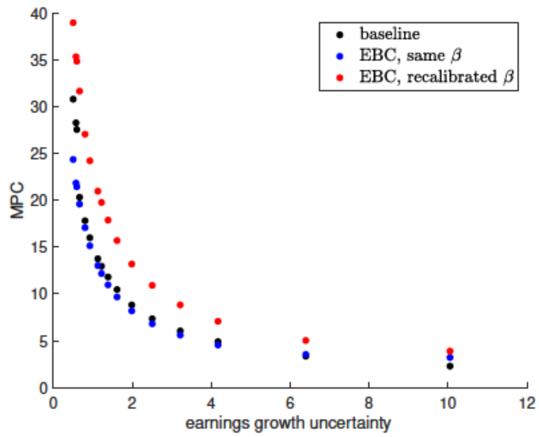
Data simulated from the stationary distribution of the model with a nonlinear pricing schedule. In the right panel, households are grouped in four quartiles of net liquid wealth (a), from the lowest (Q1, in green) to the highest (Q4, in purple). For each quartile of wealth, dots represent quantiles of earnings growth uncertainty.

The interest rate schedule makes the MPCs locally increasing in net liquid wealth among net debtors. This lowers the MPCs in the bottom quartile relative to our baseline model, and increases the MPCs in the second quartile, as showed in Figure C.10.Nevertheless, MPCs still decline with earnings growth uncertainty, at odds with the data.

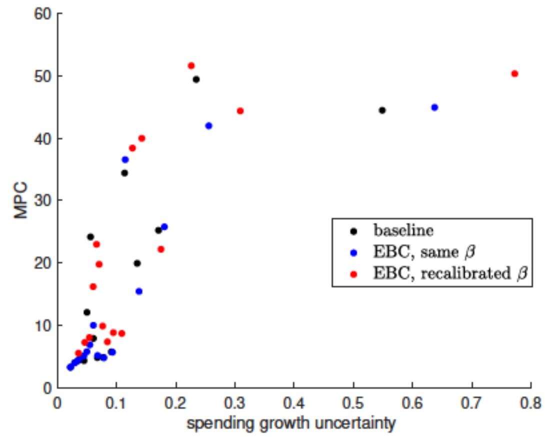
C.6 Earnings-based borrowing constraint

In this section we replace the no-borrowing constraint of Section 5 with an earning-based constraint, such that households can borrow up to a certain fraction of their current labor income. Formally, this imposes that $a' \geq -\psi y$. We calibrate $\psi = 0.185$, as in Kaplan and Violante (2014). As we show in Figure C.11a, the model predicts a negative relationship between MPCs and earnings growth uncertainty even in this model. For a given β, households are typically less likely to be financially constrained than in the baseline model, because we have effectively relaxed the borrowing limit. However, borrowing limits potentially bind more often for uncertain households, all else equal, because they face larger negative income shocks. This makes the relationship between MPCs and uncertainty slightly flatter, but still clearly declining. If we raise β to get about 14% of households at the borrowing constraint, MPCs are obviously higher, but still decline with σ. The relationship between MPCs and spending growth uncertainty remains increasing for the different parameterizations, as showed in Figure C.11b.

Figure C.11: MPC and uncertainty: earnings-based borrowing constraint



(a) Earnings uncertainty



(b) Spending uncertainty

Note: Data simulated from the stationary distribution of the baseline model of Section 5, in black, and two versions of a model with an earnings-based borrowing constraint (EBC), as described in the text. In blue, we keep all parameters are unchanged. In red, $\beta = 0.9896$ is recalibrated to match the share of hand-to-mouth households. In the left panel, the dots are associated with the 16 quantile values of σ as described in the text: for each of them, we compute the average MPC displayed on the vertical axis. In the right panel, we classify simulated data in 20 quantiles of spending growth uncertainty and, again, compute the average MPC for each of them.

C.7 Risk misperceptions

In Figure C.12 we consider a setting in which households perceive uncertainty as in the SCE, but realized earnings follow a homoskedastic process process with standard deviation of innovations approximately equal to the median level of uncertainty in the data. In unreported findings, we consider a case in which all households perceive risk that is 0.18 times realized risk, to quantitatively resemble empirical findings by Caplin et al. (2023). In that case, MPCs fall even more steeply with perceived risk.

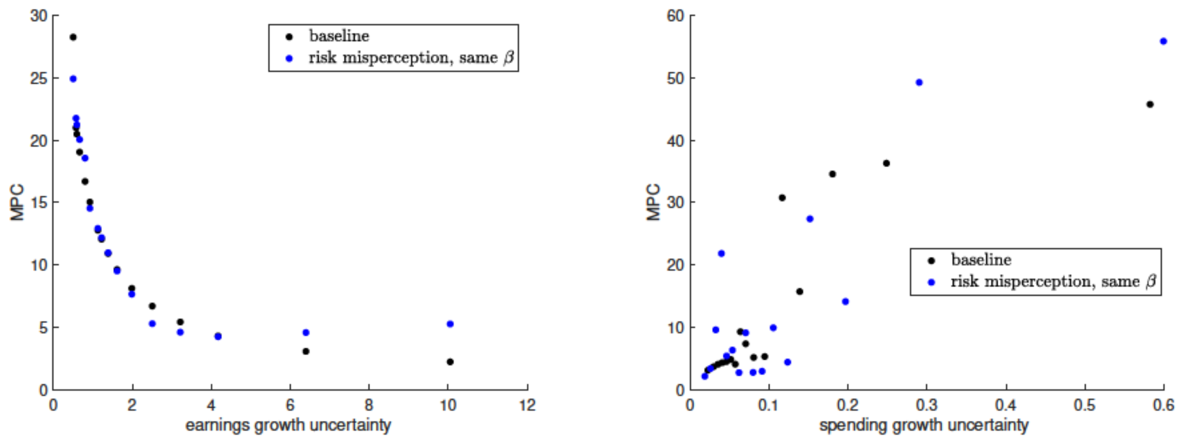
C.8 Bounded rationality and risk heterogeneity

In Section 5.3.1, we have showed how the model with bounded rationality by Ilut and Valchev (2023), extended with risk heterogeneity, gets much closer to our empirical findings than the canonical baseline model. In this appendix, we provide more details of this quantitative exercise.

We follow the quantitative implementation of Ilut and Valchev (2023) and defer to their paper for details.[2] Households have log–utility, face iid income shocks, and a no–borrowing constraint. We extend their setup to allow for heterogeneity in the variance of income innovations, calibrated to the SCE heterogeneity in uncertainty. We set $\beta = 0.9898$ and

[2]We thank the authors for sharing the code and for helpful discussions.

Figure C.12: MPC and uncertainty: risk misperceptions



(a) Earnings uncertainty

(b) Spending uncertainty

Note: Data simulated from the stationary distribution of two models. In black, the baseline model with parameterization described in Section 5. In blue, a model in which households perceive earnings growth risk as in the SCE, but that face earnings homoskedastic risk approximately equal to the SCE median uncertainty. In the left panel, the dots are associated with the 16 quantile values of σ as described in the text: for each of them, we compute the average MPC displayed on the vertical axis. In the right panel, we classify simulated data in 20 quantiles of spending growth uncertainty and, again, compute the average MPC for each of them.

$r = 0.01$ as in our baseline parameterization. Let us now summarize the key elements of their theoretical framework and defer to Ilut and Valchev (2023) for extensive discussion. Agents perfectly observe all constraints and cash–on–hand, $y_{i,t}$, but do not know the optimal policy function for consumption, $c^*(y_{i,t})$. Rather, they estimate it from a history of costly deliberation signals that follows the equation below

$$\eta_{i,t} = c^*(y_{i,t}) + \epsilon_{i,t} \ , \ \epsilon_{i,t} \sim \mathcal{N}\left(0, \sigma^2_{\eta,i,t}\right).$$

Agents reason following two ”systems”. First, they can engage in active deliberation about c^*, that is unknown. When they do so, they choose the precision of the signals, $\sigma^2_{\eta,i,t}$, but face a cost, which depends on the marginal cost of deliberation effort, κ. Second, they can decide to follow “automatic” intuition, the so–called “System 1” type of thinking, in which case they have an estimate of $\mathbb{E}\left(c^*|\eta^{t-1}, y^{t-1}\right)$ that is immediately available and does not require additional conscious effort. This form of associative memory depends on two parameters: ψ, which controls the informativeness of a given state about another state realization, and σ_c, which controls the agent's prior uncertainty about the true, unknown, policy function c^*, at any given state. Agents endogenously cycle through the two types of thinking systems.

In the quantitative exercise of Figure 6, we kept κ, σ_c, and ψ, at the values calibrated by Ilut and Valchev (2023). Moreover, we assume that households perceiving different risk face the same parameter triplet above. Next, we explore how our quantitative results change as we change these parameters. Higher σ_c increases the MPC and, beyond certain values, seems to make the MPC slightly more increasing with earnings uncertainty. Higher ψ also has similar effects. Hence, different parameterizations could get the model even closer to our empirical findings. This seems especially true if households perceiving higher earnings uncertainty also had a higher cognitive uncertainty. Disciplining these parameters, and especially heterogeneity thereof, is however a challenging endeavor, which requires data beyond the scope of this paper. We nevertheless see this as a very promising avenue for future research.