Latent Prudence or Anticipation of Shocks: Evidence and Theory from Low Risk Occupations *

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Abstract

We uncover new facts about the sources of heterogeneity in consumption and saving-investment elasticities using tax records from Spain that provide precise information on asset and residential wealth valuations. Our identification strategy relies on estimating elasticities for households whose members belong to occupational categories that are either exposed to income risk (private workers) or not (public workers). Theories based on precautionary saving predict that households more exposed to risk save more on average; their consumption elasticities, conditional on liquid assets, are higher, and in response to unanticipated shocks, they exhibit flight-to-liquidity. We find instead that the average saving-to-income ratio is higher for workers less exposed to risk. The marginal propensity to consume (MPC) is the same for households exposed and non-exposed. Furthermore, in response to unexpected shocks, non-exposed households reduce their debt and the share of risky assets and increase their share of liquid and safe assets by more. The convergence of those results suggests that other latent factors, such as preference heterogeneity, may account for those facts. We, therefore, estimate a structural model that accounts for uninsurable risk, age structure, and different occupations' bequest motives. Calibrating the income processes to our data, the model can match the facts only if households in the public sector are more risk-averse and patient.

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Keywords: Uninsurable risk, latent factors, Tax Records, MPC, Marginal Propensity to Rebalance, Micro Elasticities, Heterogenous Agent Model.

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1 Introduction

A growing research agenda is building on the premise that heterogeneity in asset holdings, saving behavior, and marginal propensity to consume is largely explained by temporary idiosyncratic shocks, which in turn affect the consumption-saving margin through precautionary behavior or through the tightness of the borrowing limit. We provide new evidence on the long-term asset-to-income ratios, average propensity to consume (APC since now on), marginal propensity to consume (MPC since now on), and marginal propensity to portfolio rebalance (MPPR since now on), also out of unexpected shocks. We do so using data from tax records and an identification strategy that estimates saving elasticities for households whose members are either employed in the public sector, and hence have little exposure to risk, or in the private sector, where they have higher exposure to risk. Contrary to what is implied by the standard precautionary saving model, we find that households with workers less exposed to risk have a higher average saving rate, that upon conditioning on liquid assets MPC is equivalent for the households with the two types of workers (despite their different exposure to risk) and that those in the public sector are more likely to increase safe and liquid assets in response to unexpected shocks. These facts suggest a role for latent factors, such as preference or beliefs' heterogeneity, rather than differences in income risk, in explaining heterogeneity in savings targets. We confirm this by estimating, on targets from our data, a structural model with heterogeneous agents, demographic structure, workers holding jobs in different sectors, and bequest motives. Through the lens of the model, the MPC equivalence can be explained only if public-sector workers are more risk-averse and more patient.

Our paper uses high-quality tax data from Spain and focuses on identifying the role of income risk versus latent factors. One long-established view emphasizes the role of precautionary savings in the face of uninsurable risk and incomplete markets, thereby explaining MPC heterogeneity through the distribution of assets (see Aiyagari (1994) and Bewley (1980)). Building on this hypothesis, a large literature (which we review below) estimated the response of consumption to identified income shocks by grouping individuals with similar demographic characteristics and assuming that MPC is invariant across the time sample. There is, however, growing understanding that other latent factors, such as patience

and risk-attitudes, may be important in explaining the MPC distribution than uninsurable risk: see Aguiar and Bils (2015) infers this by focusing on the behavior of hand-to-mouth ; Lewis et al. (2024) use cluster analysis to obtain an unconditional MPC distribution and they show that only a small fraction of it is explained by observables, while a large fraction is to be imputed to latent or preference factors.[1] Furthermore, recent panel and experimental evidence casts doubts on the quantitative relevance of the liquid assets positions (see, for instance, Boehm et al. (2025)) or finds a role for permanent income, besides that of liquid assets (see Commault (2025) and an earlier study by Dynan et al. (2004)).

Two factors make it hard to empirically identify the sources of the propensity to consume and save. First, they have mostly been estimated using survey data, which, although highly reliable, have limited information on asset component valuations. Second, researchers could at best condition on observables but lacked a reliable measure of latent factors.

More specifically, we rely on a dataset of tax records from Spanish households, matched with social security information, for the period 2016-2022. The full dataset includes information on age, income and its components, wealth and its components, other demographics, zip code, job type, and households' composition. Since housing is one of the main components of wealth, we match zip codes to high-resolution, high-quality data on housing values. For all other asset classes, values and returns are available in the tax records. Furthermore, using this highly precise asset valuation, we can estimate changes and savings, which in turn allow us to estimate consumption using the per-period budget constraint (see Aguiar and Bils (2015)). We focus our analysis on the set of households whose composition remains stable during the sample period: this definition, equivalent to a balanced panel, ensures that our results are not driven by changes in households' composition.

First, we present statistics on income and portfolio composition for private and public employees. We find that public employees have higher mean income and wealth, and lower dispersion of both. Their income progression over a lifetime is also more stable than that of private employees. We find that the APC, measured by consumption-to-income ratios, is smaller for public employees, suggesting that, despite their low exposure to risk, those

[1]The view that uninsurable risk may not be the main driver of the response of consumption and saving to unexpected shocks has been raised before. See, for instance, the following quote by Thomas Piketty: "Although precautionary saving in anticipation of short-term shocks does indeed exist in the real world, it is clearly not the primary explanation for the observed accumulation and distribution of wealth."

households have a higher average propensity to save.

Next, we estimate classical Mincer regressions for income and econometric specifications linking changes in either consumption, wealth or its components (residualized or not) to the exogenous Mincer earnings. Wealth components include: debt, cash, residential wealth, risky and safe asset components. Hence we estimate the marginal propensity to consume (MPC), the marginal propensity to wealth changes (MPW) and the marginal propensity to portfolio rebalance (MPPR). First, we confirm that the volatility of the Mincer is higher for private employees, hence they face more risk. Theories that emphasize precautionary savings motives would predict that, conditional on liquid assets, households more exposed to risk should have higher MPC. Furthermore, in response to unexpected shocks they should reduce their share of debt and of risky assets, including residential wealth, and increase the share of liquid and safe assets. We find that, conditional on observable and liquid assets, MPC are the same between households with members working in either the public or the private sector, despite their difference in risk exposure. We confirm the equivalence also for the MPW. Furthermore, we find that in response to unexpected shocks households with public employees reduce their share of debt, of residential wealth and of other risky asset components, and increase the share of cash and safe assets. The convergence of all those results, coupled with our identification strategy which is based on a clear conditionality on the risk exposure, make us conclude with confidence that differences in latent factors, such as risk-attitudes or discount factors, shall account for our findings.

We test this hypothesis by estimating a structural model with heterogeneous agents using a simulated method of moments. We lay out a structural model of households' optimization with uninsurable risk, finite lifetimes, bequest motives, and portfolio investment in liquid and non-liquid assets, subject to portfolio adjustment costs. In the model, there are two groups of households, whose income processes we calibrate using the data-equivalent Mincer equation for public and private employee households. We then estimate the preference parameters (risk attitudes and discount factors) and the parameters governing bequest motives in the structural model using simulated method-of-moments. For the estimation, we target the average consumption-to-income or total assets-to-income ratio for different age groups and occupations, as well as each occupation's MPC. First, we show that, conditional on the hand-

to-mouth status, for the model to match the MPC equivalence, the estimated preference parameters must assign higher risk aversion and lower discount factors (i.e., greater patience) to households with public-sector employees. To assess the relative roles of differences in income level versus preferences for risk, we run counterfactuals and show that the latter accounts for the bulk of the results.

Those results can be informative along many dimensions for building macro models that account for relevant heterogeneity and, hence, focus on the most realistic channels of response to policy and shocks. Furthermore, in the presence of preference heterogeneity, fiscal policies targeting specific groups, intended to maximize the multiplier's impact, may have unintended consequences when based on a mistaken understanding of the sources of this heterogeneity.

Literature Review. Uncovering the sources of MPC heterogeneity and the relative importance of different determinants is a long-standing question in macro and related fields: influential papers (see Zeldes (1989)) highlighted the role of precautionary savings, also coupled with borrowing constraints (see also Carroll and Kimball (1996)). There is also an understanding that other forms of latent heterogeneity (risk attitudes or expectations; see Carroll and Wang (2023)) may influence both the MPC and the selection of agents into different shares of liquid assets (see Carroll et al. (2014)). One of the first papers to provide a direct estimate of the precautionary motive for saving is Dynan et al. (2004). Using SCF data, they study whether households hold higher wealth when the risk of unemployment is higher. They find a positive relationship, although with a relatively small coefficient.

Broadly speaking, our work relates to the literature documenting that, besides demographics, the permanent component of earnings has a sizable impact on consumption, often larger than that of temporary, unexpected changes. The lifetime asset to income ratio are also often associated with latent factors. One of the first papers to find a sizable role for lifetime income in both the APC and the MPC is Dynan et al. (2004). They find a strong positive relationship between saving rates and lifetime income and a weaker but still positive relationship between the marginal propensity to save and lifetime income. The authors argue that their evidence favors precautionary savings and bequest motives over differences in preferences and discount factors. We too find lower APCs and MPCs for higher-income

households; however, those are also the ones with public employees, so their income risk is near zero. Those two instances combined lend support to the hypothesis that latent differences in preferences may account for our results.

Our paper relates also to a recent literature that reconsiders the role of latent factors, from preferences to beliefs, for the marginal propensity to consume (see Aguiar et al. (2024) or Lewis et al. (2024)) or to work (see Dagsvik and Jia (2016) among others). Furthermore, Eichenbaum et al. (2025) argue that to account for the response to unexpected fiscal transfer heterogeneity in beliefs is needed. We narrow down the latent factor driving consumption-saving decisions by focusing on the limiting case of households in which at least one worker has near-zero income risk and by conditioning our estimates of the MPC on all observables in our data.

There is also recent evidence that the role of the permanent component is larger than that of liquid wealth (see Aydin (2022), Ganong et al. (2020), Fagereng et al. (2021), Baugh et al. (2021), Golosov et al. (2024), and Commault (2025) among others), whose role is primarily justified by the dependence on unexpected temporary shocks. Compared to most of the above papers, our study also relies on high-quality administrative data, providing highly precise information on asset values, which are among the largest sources of measurement error in survey data.

To indirectly identify the role of temporary versus permanent income components, recent literature has attempted to measure MPC across different asset holdings. More specifically, some experimental studies using either vignettes (see Fuster et al. (2021)) or field experiments (see Boehm et al. (2025)) examine the role of liquid wealth in MPC but yield conflicting results.

The baseline methodologies we employ to estimate MPC are standard in the literature (see Blundell et al. (2008)). Broadly speaking, those methodologies derive a testable implication from a dynamic consumption-saving optimization under uncertainty and incomplete markets regarding the responses of consumption and wealth to unexpected income shocks. The latter are obtained from estimating a Mincer regression. We follow the same procedure with one simple modification: we estimate separately for the panel of private and public workers, with the latter having near-zero income risk, conditioning on all available demographics and geographic controls, as well as on their liquid wealth composition.

Our estimates can inform a vast literature that builds macro models with heterogeneous agents, either due to income shocks (see Aiyagari (1994) or Bewley (1980)) or to other observable or latent factors. To highlight the theoretical implications of our estimates, we also build a heterogeneous households model for consumption-saving optimization that includes several sources of heterogeneity and use it to draw implications for the latent heterogeneity needed to match our empirical results. While this class of models spans several strands of the literature in macro, household finance, and labor, a recent paper that has been decomposing the sources of consumption-saving heterogeneity into income, health risk, and family motives is Borella et al. (2025).

2 Data and Empirical Methods

2.1 Data and Variable Construction

The Spanish Household Panel (SHP) is a representative sample of households with complete administrative information on income and wealth. It integrates data from three main sources: the National Statistics Institute (INE), which provides information on population and household characteristics; the State Tax Administration Agency (AEAT), which supplies income, wealth, and other tax-related data; and the Social Security Office, which contributes labor market histories.

The panel adopts the INE's definition of a household as "a group of one or more people who normally live in the same residential dwelling for all or most of the year, without the requirement of family ties." [2] The reference year is 2016, when a stratified sample of households was drawn according to three criteria: autonomous community (seventeen regions), household type (ten categories, distinguishing, for example, single-person households, households with minors, and multigenerational households), and gross income bracket (nine groups, ranging from no information to over €300,000). All individuals from households sampled in 2016 are included in the panel. In each subsequent year, the panel expands with a representative sample of newly eligible households. The initial panel includes more than 772,000

[2]The population of households in a given year is defined as a partition of the set of eligible individuals in that year. An individual's eligibility depends on permanent residence and geographical location, with residence limited to regions of Spain under the Common Fiscal Regime (thus excluding Navarra and the Basque Country).

households—4.6% of the total—comprising 2.1 million individuals.

Our sample covers the period from 2016 to 2023. Because household identifiers in our data are only consistent within a given year (and not across years), our baseline analysis restricts the sample to household-years in which composition remains unchanged over the following two years.

The SHP provides high-quality data on income and wealth, in particular, a detailed registry of immovable property ownership, the main saving vehicle of Spanish households (see A for details on asset values and savings). This allows us to construct a reliable measure of consumption using the intertemporal budget constraint. Specifically, we infer consumption from income and changes in wealth: consumption is the difference between available resources (income and initial assets) and the savings carried over to the next period. The intertemporal budget constraint is:

$$c_t + a_{t+1} + b_{t+1} + f_{t+1} = y_t + a_t + b_t + f_t + i_t + T_t \tag{1}$$

where c_t denote consumption expenditures, a_{t+1} and b_{t+1} denote, respectively, cash (balances held in deposit accounts) and non-liquid assets, f_t denotes holdings of financial assets net of debt, whereas y_t measures after-tax labor income, T_t denotes net private and public transfers, and i_t denotes asset income, including net income from financial assets (i.e., interests and dividends) and income from real wealth (rental income). Financial wealth includes stocks, bonds, shares in investment funds, insurance, and pension funds, whereas real illiquid wealth includes real estate and other valuables (e.g., precious metals, art).

Income measurement is straightforward, as our administrative data cover the main sources of household income.[3] In contrast, computing savings requires measuring changes in net wealth and adjusting for valuation effects.

To do this, we group wealth components into three categories based on how valuation effects are treated. The first group includes assets with negligible or no valuation effects: cash, bonds, insurance, and other financial assets. For these items, savings are simply the change in end-of-period values over time.[4]

[3]The only imputed financial income component is interest paid on outstanding debt, which we compute using debt balances and the aggregate cost of debt for the household sector.

[4]This group also includes non-urban and non-residential properties, which are valued at cadastral values.

The second group includes financial assets valued at market prices, whose changes may reflect significant valuation effects: stocks, investment funds, and pension funds. For these assets, savings are defined as the change in end-of-period values minus the valuation effect, where the latter corresponds to the return on the initial position from holding the asset over the period. We proxy these returns using the Banco de España equity return index for equity holdings, and the Banco de España investment return index for investment and pension funds.

Finally, we treat urban residential real estate separately, as our data tracks all changes in ownership titles at the micro level. This allows us to observe actual investment flows directly, which by construction are free of valuation effects. The dataset includes the start and end dates of ownership for each property, enabling us to capture all acquisitions and disposals over time. To value these changes, we combine information on property characteristics (surface area and location) with market prices per square meter at the city district-year level. These prices are drawn from microdata covering a near-universe of real estate transactions provided by the Colegio de Registradores. We compute savings in residential real estate as the product of (i) the change in ownership stake for a given person–dwelling pair over the year (typically from 0 to 50% or 100% or vice versa), (ii) the dwelling's surface area, and (iii) the average transaction price per square meter in the dwelling's district.

Our final measure of savings is the sum across the three components described above, and consumption is defined as total after-tax income minus savings.

Two notes merit further discussion. First, residential housing is the largest asset in Spanish households' portfolios, but not all changes in ownership are market transactions. Some reflect inheritances or donations, which may lead us to mismeasure savings. For example, an expenditure imputed on inherited real estate should be offset by an equivalent wealth inflow, implying no actual cash outflow. Since we cannot distinguish between market and non-market transactions and can only identify individuals who receive or give assets through inheritance or donation, we perform robustness checks excluding households with at least one member involved in such transfers during the sample period.

Since these values evolve slowly over time, changes in asset values mainly reflect changes in ownership rather than valuation effects. We adjust cadastral values using a factor that reflects the average market-to-cadastral valuation ratio over time, similar to the approach used by AEAT.

Second, we do not impute the business wealth of entrepreneurs, although we do include business income in total income. Since the share of business owners in Spain is relatively small and our analysis focuses on households whose primary earners receive labor income, the measurement error from excluding business wealth is likely to be limited.

2.2 Descriptive statistics

We start by providing stylized facts on the income and wealth composition and their distributions for the full sample of households, and also for households with at least one employee working in the public or private sector. We examine the breakdown of the wealth composition, also conditioning on age.

The goal here is to gather some stylized facts that will already provide suggestive evidence on the underlying factors that determine the distribution of consumption-saving responses and households' investment behavior. Furthermore, the consumption-to-income ratio will be used to calibrate the structural model presented below.

Income Distribution and Composition. First, Table 2 shows the distribution of income across percentiles for the full sample and breaking down across households with public and private employees. Those with public employees tend to have higher mean income and less income dispersion. The lower dispersion is due to the nature of this occupation: selection is determined by very specific criteria, so the contract conditions are limited to a narrow set of options. Furthermore, beyond a certain level of tenure, the income progression is highly predictable. The low dispersion in the sum is also a proxy for income risk, discussed in detail later.

A few other considerations are worth noting. The association between high mean income and low dispersion is somewhat surprising. Conventional wisdom holds that high-risk jobs tend to pay a premium: recent survey evidence from the US (see, for instance, Dillon (2018)) confirms that high-risk occupations usually pay a wage premium. In this institutional setting, however, the wage premium for public sector occupations is just part of, and confirms, the privileged and protected nature of these jobs. From an economic point of view, this equilibrium outcome is rationalized by tight entry selection, which requires high skills, substantial investment in education, and selection through public exams, akin to an entry

barrier. Those same features, however, may also indicate the latent preferences behind the decision to enter a career in this sector: the incentives to invest in long-term education to secure a job with high job protection and low risk suggest patient, highly risk-averse individuals. This may also provide a consistent explanation for the evidence we uncover below on consumption-saving behavior among households with public employees, whose saving rates appear to be higher than those dictated by their low income risk: this, too, may be associated with patience and risk-averse attitudes.

Next, we examine the composition of income to shed further light on the potential sources of risk. Table 3 shows income composition for the full sample and the two groups. Public employees tend to have higher labor earnings and less capital income, once again signaling low risk exposure. Disposable income tends instead to be lower, a possible reflection of progressive taxation.

Wealth Distribution and Composition. The wealth composition can inform on the preferences for safer, as opposed to riskier, assets of the two groups. The wealth distribution, when coupled with information on income distribution, can provide indications of the extent of precautionary savings across the two groups.

First, public employees have higher wealth (see Table 4), but mostly for those households at the lower end of the distribution. Wealth levels become pretty similar between the two categories at the top of the distribution. High wealth among public workers at the bottom of the distribution is due to higher saving rates among households with public-sector employees. Table 1 shows the consumption-to-income ratios by age groups for households with employees in the private and public sectors: households in the public sector have lower consumption-to-income ratios, hence higher saving rates, especially at younger ages.

Next, we can further assess the potential role of preferences for saving behavior by examining the portfolios' asset compositions between the two groups. This is shown in Table 5, also broken down by age groups. On average (first column), households with public employees have more wealth. This is due again to the higher saving rates, which we can infer from the consumption to income ratios shown in Table 1. Those households have higher saving rates despite lower income risk, suggesting they are more risk-averse. In terms of wealth components, the share of safe assets is higher among low-wealth households with

public employees; the share of risky assets is slightly higher across most groups, but at the top wealth levels. Those patterns seem to be driven more by the lifecycle than by risk preferences.

Average Propensity to Consume. Before closing this section, we computed and reported the average propensity to consume (APC since now on) for both types of households, and across different age groups, see Table 1. Private employees exhibit a slightly higher consumption-to-income ratio than public employees at all ages. This is despite their lower lifetime income. This implies that households with private employees save less. Given their higher risk and lower lifetime income, we interpret this as suggestive evidence of their risk attitudes.

Table 1. Average Propensity to Consumer, measured as Average Consumption to Income Ratio.

Consumption to Income		
	Private	**Public**
Ages 25-34	0.92	0.87
Ages 35-44	0.86	0.84
Ages 45-54	0.88	0.86
Ages 55-64	0.92	0.89

Note: Data moments are authors' own calculations based on the Spanish Household Panel, 2016 - 2023.

3 Empirical Specifications and Results for MPC and MPPR

We now present the regression specification used to estimate the MPC, along with the regression results for all our household groups.

The main specification estimates the response of log consumption growth onto log income growth by household type, defined by the employment status of the household head:

$$\Delta c_{it} = \beta^{\tau} \Delta y_{it} + \gamma^{\tau} \Delta X_{it} + \xi^{\tau}_{\text{comp(i)t}} + \phi^{\tau}_{\text{city}(i)t} + \theta^{\tau}_{\text{age}(i)t} + \varepsilon_{it} \tag{2}$$

where Δc_{it} is log consumption growth of household i in period t, and Δy_{it} is household's income log change. Control variables in X_{it} include the the number of children, older

members and members with Spanish nationality.[5] $\xi^{\tau}_{\text{comp(i)t}}$ is the effect of household's composition defined as the interaction of the number of household members, the number of female members, the number of members with Spanish nationality, the number of members born in Spain, the number of children, and the number of older members (all modeled as categorical variables with values of 1, 2, or 3+ members). $\phi^{\tau}_{\text{city}(i)t}$ are city-time fixed effects, and $\theta^{\tau}_{\text{age}(i)t}$ is the household age effect, where age is defined in terms of five-year age bins of household head. All controls and fixed effects are interacted with the household type (hence, the type τ upper index on the coefficients).

In subsequent regressions, we replace log consumption growth with log wealth growth or the log changes in its components. The latter includes debt, residential wealth, cash holdings, risky, and safe assets.

Furthermore, we also run the regression conditioning on the households' hand-to-mouth status (HtM). The HtM households are those whose end-of-period cash balances fall below their monthly current income (see Weidner et al. (2014)). In this specification, the coefficient on income is allowed to vary with HtM status:

$$\Delta c_{it} = \sum_{\text{HtM}\in 0,1} \beta_0^{\tau,\text{HtM}} \Delta y_{it} + \sum_{\text{HtM}\in 0,1} \beta_1^{\tau,\text{HtM}} + \gamma^{\tau} \Delta X_{it} + \xi^{\tau}_{\text{comp(i)t}} + \phi^{\tau}_{\text{city}(i)t} + \theta^{\tau}_{\text{age}(i)t} + \varepsilon_{it} \quad (3)$$

where $\beta_1^{\tau,\text{HtM}}$ stand for the coefficients of interaction of the HtM status and the type of household.

The estimation sample includes households with complete wealth information for all adult members and at least one adult whose primary income source is labor income (wages and salaries, excluding severance payments). We restrict the sample to household-years with unchanged member identities.

Results MPC. Results for the MPC, namely the β in the regression of consumption changes on residualized income changes, are shown in Table 6 in the upper part. The baseline estimates, which do not condition on the HtM status, show a slightly lower MPC for public-employees. The difference in the estimates between the two types of households

[5]The variables included in X effectively residualize income and consumption *levels* with respect to the standard demographic characteristics. Because our baseline sample is restricted to household-years with unchanged composition between periods t and $t-1$, we exclude from X variables that remain constant over these periods, such as the number of household members, the number of females, and the number of foreign-born members.

is significant. The results of this regression are broadly in line with models of precautionary savings, featuring borrowing constraints, which would predict a higher MPC for households more exposed to risk. However, the results of this regression are largely driven by the asset compositions and do not necessarily inform on the role of uninsurable risk for the saving elasticities.

Therefore, we repeat the estimates by conditioning on hand-to-mouth (HtM) status and allow the MPC to differ across constrained and unconstrained households. If precautionary savings affect consumption-saving elasticities, we should expect different MPCs for the two types of households, as they are differently exposed to risk. Instead, we now find that their MPCs are equivalent, or statistically indistinguishable. Consider first the unconstrained households (second row of Table 6). Since those households are unconstrained, only precautionary savings should matter, and we should expect a lower MPC for households more exposed to risk. The equivalence of the MPC suggests that they are relatively more risk-takers. Consider now the HtM households: the binding constraint, coupled with income risk, increases the curvature of the utility function, making those more exposed to risk also more responsive to income shocks. In other words, we should expect a higher MPC for private workers. Instead, we again find an equivalence, suggesting that the underlying curvature of the utility function is relatively higher for households with public employees. This may be due to their greater risk aversion. We will test this hypothesis of the differences in preferences later on by estimating a structural model on our data. The model's estimates will confirm our conjecture.

Results for MPW and MPPR. The lower part of Table 7 shows the estimates of the β coefficient for the specification 2 featuring changes in log wealth as dependent variable. This is a proxy for the saving rate. Based on theories of precautionary savings, we should expect differences in the saving elasticities, which are complementary to those discussed above for the consumption elasticities. We again find a statistical equivalence between the MPW.

At last, we repeat the estimates of 2 using as dependent variable the log changes in all wealth components: debt, cash, residential wealth, risky, and safe assets. Results are shown in Tables 6 (lower part) for debt, Table 7 (lower part) for financial assets, Table 8 for real estate and risky financial assets and in Table 9 for cash holdings and safe assets. According

to precautionary saving theories, we should expect that in the face of unexpected shocks, households more exposed to risk reduce their debt by more, reduce their exposure to all risky assets, including residential wealth, by more, and increase their exposure to liquid or safe assets. We find the opposite.

The convergence of all those results, coupled with our identification strategy, which is based on a clear conditionality on the risk exposure, makes us conclude with confidence that differences in latent factors, such as risk attitudes or discount factors, shall account for our findings.

4 Life-Cycle Model with Uninsurable Risk, Different Occupations and Bequest Motives

We now lay out a heterogeneous-agent model in which households make consumption-saving and portfolio-optimization decisions, face uninsurable risk, and occasionally face binding borrowing constraints. To map our empirical settings as closely as possible, we introduce a life-cycle through random generations, making consumption and saving rates conditional on age. Furthermore, we introduce a bequest motive, which can explain the increase in APC with lifetime income. More specifically, individuals begin their economic lives at age 25, enjoy consumption, and leave a bequest upon death. We also allow them to work in two types of occupations, whose income processes we calibrate directly using the Mincer equation we have estimated for public and private employees. In sum, the households in the model differ by age, occupation (public or private employee, fixed at the beginning of life), labor productivity, and asset holdings (liquid and illiquid).

Demographics and Preferences. Age is indexed by $j = 1, \ldots, J$. Each period, a mass of new individuals enters the economy, where the rate of population growth is assumed to be n. Individuals face the risk of early death in each period, but they die with certainty at age J. Let ψ_j denote the probability of surviving to age j, conditional on surviving to age $j-1$.[6] Furthermore, let $p_j = \prod_{k=1}^{j} \psi_k$ denote the unconditional probability of survival to age j.

[6]Naturally, $\psi_1 = 1$ and $\psi_{J+1} = 0$. In the steady-state, demographic patterns are stable, so that age-j agents

Individuals maximize expected lifetime utility, which is given by

$$\mathbb{E}_0 \left\{ \sum_{j=1}^{J+1} \beta^{j-1} \left[p_j u_j(c_j) + p_{j-1}(1-\psi_j) v(a_{j+1}) \right] \right\}. \tag{5}$$

Here c_j denotes consumption of non-durable goods at age j, w_J is the total wealth of household at age J, β is the discount factor. Expectations are taken with respect to idiosyncratic income shocks. The instantaneous utility function u is an aggregator over consumption and leisure

$$u_j(c_j) = \frac{c_j^{1-\vartheta} - 1}{1-\vartheta} \tag{6}$$

while the bequest function v is given as in: De Nardi and Yang (2014)

$$v(w) = \varrho_1 \frac{(w+\varrho_2)^{1-\vartheta} - 1}{1-\vartheta}, \tag{7}$$

where ϑ is the risk aversion, ϱ_1 measures the strength of bequest motive while ϱ_2 measures how luxurious is the bequest.

Occupation and Labor Income. Individuals are heterogeneous also because of the occupation they work in, o, which can be either in the public or in the private sector. This decision is made at the beginning of their life, hence before the recursion of the consumption-saving decisions that we examine, and remains constant over their lifetime. Individuals also differ by their income level y, the logarithm of which we model as a sum of a deterministic component $\xi_{o,j}$ and three stochastic components (permanent heterogeneity α_o, persistent shocks $z_{o,j}$, and transitory fluctuations $\epsilon_{j,o}$). The income of individual i of occupation j at age j is given by:

$$\ln y_{i,o,j} = \xi_{j,o} + \alpha_{i,o} + z_{i,o,j} + \epsilon_{i,j,o} \tag{8}$$

make up a constant fraction of the total population μ_j. In particular, we can define μ_j recursively, so that:

$$\mu_{j+1} = \frac{\psi_{j+1}\mu_j}{1+n}, \quad j = 1, \ldots, J-1 \tag{4}$$

with μ_1 such that $\sum_{j=1}^{J} \mu_j = 1$.

where we assume that

$$\alpha_{i,o} \sim \mathcal{N}(0, \sigma^2_{\alpha,o}), \tag{9}$$

the persistent component $z_{i,o,j}$ is given by

$$z_{i,o,j+1} = \rho_{z,o} z_{i,o,j} + \eta_{i,j+1,o}, \tag{10}$$

$$z_{i,1,o} = 0, \quad \eta_{i,j,o} \sim \mathcal{N}(0, \sigma^2_{\eta,o}), \tag{11}$$

and the transitory income component is iid across individuals and age, and is given by

$$\epsilon_{i,j,o} \sim \mathcal{N}(0, \sigma^2_{\epsilon,o}). \tag{12}$$

Individuals receive labor income between ages 1 and W, and retire thereafter. Retired individuals receive pension income π_j equal to a share of their last-period earnings (dependent on the last realization of the persistent shock):

$$\pi_j = \rho_{ss} y_W, \quad \forall j > W. \tag{13}$$

Government. A government collects revenues and finances a stream of expenditures. On the revenue side, the government collects labor income taxes and social security contributions from working-age households. On the expenditure side, the government finances old-age pensions for retirees and a stream of exogenous government consumption. Labor income taxation is modeled as a linear tax with a rate τ_y.

Recursive Formulation. Given the assumptions above, the households make consumption-saving decisions. The households' optimization problem admits a recursive formulation. Since the model also features a life-cycle, we can solve the optimization problem backwards, starting from the last period of life (denoted by J) and proceeding to birth (period 1), and let j denote the household's age. In what follows, we omit dependence on the occupation type

o. In the last period of life, the household solves the following problem:

$$V_J(b, y) = \max_{c,b'} u(c) + \beta\, v(b') \tag{14}$$

$$\text{s.t.} \quad b' + c = (1 + r_b)b + (1 - \tau_y)y \tag{15}$$

$$w = b' \tag{16}$$

$$b \geq \underline{b} \tag{17}$$

Retired households solve the following problem..

$$V_j(b, y) = \max_{c,b'} u(c) + \beta \left[\psi_{j+1} V_{j+1}(b', y') + (1 - \psi_{j+1}) v(b')\right] \tag{18}$$

$$\text{s.t.} \quad b' + c = (1 + r_b)b + (1 - \tau_y)y \tag{19}$$

$$y' = y \tag{20}$$

$$b \geq \underline{b} \tag{21}$$

In the last working period of life, the household solves the following problem.

$$V_j(b, y) = \max_{c,b'} u(c) + \beta \left[\psi_{j+1} V_{j+1}(b', y') + (1 - \psi_{j+1}) v(b')\right] \tag{22}$$

$$\text{s.t.} \quad b' + c = (1 + r_b)b + (1 - \tau_y)y \tag{23}$$

$$y' = \rho_{ss} y \tag{24}$$

$$b \geq \underline{b} \tag{25}$$

Working-age households solve the following problem.

$$V_j(b, y) = \max_{c,b'} u(c) + \beta\, \mathbb{E}_{y'} \left[\psi_{j+1} V_{j+1}(b', y') + (1 - \psi_{j+1}) v(b') | y\right] \tag{26}$$

$$\text{s.t.} \quad b' + c = (1 + r_b)b + (1 - \tau_y)y \tag{27}$$

$$y' \sim \Gamma(\cdot \mid y) \tag{28}$$

$$b \geq \underline{b} \tag{29}$$

5 Estimation

We estimate the model's latent parameters using the simulated method of moments. This implies that we set some parameters based on past studies or based on observables from our own data. The income process for the households with public and private employees is calibrated on our data. The parameters related to risk attitudes and discount factors are estimated to match the MPC estimated in our data, after conditioning on the hand-to-mouth status; hence, the estimates from table 6.

Calibration of Income Process. We estimate the income process separately for private and public workers. We proceed with the estimation in two stages. First, we extract the deterministic component of earnings by regressing log earnings on a quartic polynomial in age. The estimated parameters are in the first part of Table 11. We then estimate the stochastic parameters of the process (the variances of the permanent and persistent components, and the variance of the transitory component) from the predicted residuals of the regression above. We target measures of earnings inequality within occupation groups across different stages of working life. The estimated parameters are reported in the second part of Table 11.

Figure 1 displays the estimated deterministic age profiles of earnings by occupation. Consistent with the data, average earnings are higher for households with public-sector workers at each age.

Table 12 shows that the estimated earning process generates a realistic average level and distribution of income for each occupation type. Public employees, on average, have a higher level of income, as well as lower dispersion of income for all ages (also reflected in the estimated parameters in Table 11). Moreover, the implied lifetime variance for private employees is about 50% higher than that for public employees.

Other Calibrated Parameters. Next, we describe the remaining parameters that we calibrate using our data or past studies. The interest rate on assets r_b is set to 1%. We set the labor income tax rate, τ_y, to 20%, which corresponds roughly to the average effective tax rate in Spain. Survival probabilities ψ_j are taken from life tables of the Spanish National Statistics Institute. We set the last working period W to 64 years (corresponding to period 40 in the model), and the maximum age J to 85 (corresponding to period 61). The replacement rate of the pensions ρ_{ss} is set to 75% and is the same for both occupations.

5.1 Results from the Simulated Method of Moments

We estimate the remaining parameters using the Simulated Method of Moments. Specifically, we estimate the risk aversion parameter σ , the discount factor β, the parameters of the bequest function ϱ_1 and ϱ_2, and the borrowing limit. We allow all parameters to differ across occupation types. In the estimation, we target the MPC conditional on hand-to-mouth status, both for non-HtM and HtM individuals. Our definition of the MPC mirrors that of the empirical section: it is the change in consumption in response to an unanticipated income shock. To compute the MPC, we proceed as follows. First, we simulate the stochastic steady state and extract observations for the consumption-saving decisions for all individuals. Using those observations, and in line with the empirical specification, we regress changes in log income on log consumption. The model-based elasticity estimate matches its empirical counterpart. The HtM status is also defined as in the empirical analysis: an individual is HtM if his end-of-period holdings of liquid assets are below his monthly income. Estimated parameters from the model are reported in Panel A of Table 10, while the estimated moments are reported in Panel B of Table 10.

Given the parameters reported in Panel B of Table 10, the model reproduces the same MPC for public and private employees, conditional on them not being HtM (0.58). The model also reproduces the same MPC across two occupational groups, conditional on being HtM. The MPC for HtM consumers is quite high in the data, around 0.95. In the model, we get a somewhat lower value. This is so since our model features one asset and, in the absence of large changes in asset valuation, the probability that households are hand-to-mouth is rather low. We expect that extending the model to feature a portfolio choice between two assets will also allow us to match the exact values.

In the model, public and private individuals have the same level of MPC (conditional on HtM status) only when public employees are more risk-averse and more patient. Differences in bequest motive and in the borrowing limits are less pronounced, as both require a similar strength of the bequest motive and relatively tight borrowing limits.

To sum up, the standard model with uninsurable risk would predict that, upon conditioning on households' composition and measuring the MPC as conditional on borrowing constraints, those exposed to higher income risk shall have higher MPCs. In the data, we find

that households with public-employees, hence with lower exposure to risk, and those with workers in the private sector, hence highly exposed to risk, have the MPC, once we condition on liquid assets. Through the lens of the model, we show that this can be rationalized solely when the two types of households differ in terms of latent factors, primarily risk attitudes and patience. This is also an economically plausible result: it is very likely that those who selected themselves into the public sector, which is notoriously more protected, are more risk-averse.

5.2 Counterfactual Scenarios

The model implied that, for households with public and private employees, having the same MPC conditional on HtM status requires their preferences to differ, with public employees being more risk-averse and more patient. To stress-test this prediction, we now devise counterfactual scenarios in which we vary some of the preference parameters and examine their relative roles in accounting for the evidence on the MPCs.

First, we recompute the MPC for households with public employees, imposing the same preferences as those of the private households: specifically, we lower their risk aversion and discount rate. Simulated results are reported in the 4th column of Table 13. Independent of the HtM status, individuals in the public sector now exhibit higher MPC. At last, we note that the estimated earnings processes for the two household types show differences both in the level, higher for the workers in the public sector, and risk, lower for those. We therefore ask which of these earnings differences accounts for the difference in preferences needed to match the MPC equivalence between the two household types. We report the results in the last column of Table 13. In the fourth column, we present the MPCs when households have the same preferences and different income levels, and in the last column, we present the MPCs when households have the same income levels but different preferences. The fact that this last case gets closer to the data, or else matches the MPC equivalence conditional on the HtM status, suggests that the main determinant of the MPC channel in this case is income risk rather than income level.

6 Conclusions

The consumption-saving elasticities have important implications for responses to policy and shocks, as well as for inequality. Still, the sources of their heterogeneity are debated. Prominent theories assign a prominent role to precautionary saving motives in the presence of uninsurable risk and, occasionally, borrowing constraints. Heterogeneity in latent factors, however, is likely to play a significant role too.

In this paper, we test the role of uninsurable risk versus preference heterogeneity using data from tax records in Spain and a novel identification strategy that estimates APC, MPC, and MPPR for households whose members are exposed to risk (private workers) or not (public workers). We uncover a set of novel facts that appear to contradict several tenets of precautionary saving theories. APCs are larger for those not exposed to risk. MPC is equivalent for exposed and non-exposed. Finally, in response to shocks, those exposed to risk increase their share of debt and risky assets, while those not exposed reduce it. Furthermore, the non-exposed increase their share of cash and safe assets more than those exposed. Collectively, those facts suggest that latent factors, such as preference heterogeneity, are likely to account for those facts.

We corroborate this hypothesis by estimating a structural model with households heterogeneous in income risk, sector of employment, and age. Through the lens of the model, the facts uncovered in the data can be explained only if public-sector employees are more risk-averse and more patient.

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Table 2. Distribution of gross income

All statistics are computed using population weights by year, then averaged across all years. Income is expressed in thousands of euros and deflated using the CPI (base year 2021). Shares are in percent.

Column (1) includes all households with positive gross income and complete income information for all adult members.

Columns (2)-(4) include all households with positive gross income, complete income information for all adult members, and at least one adult whose primary income source is labor income (wages and salaries excluding job loss indemnifications). Public-sector households are employed households in which the highest-earning adult is employed in the public sector; Private-sector households are employed households in which the highest-earning adult is not employed in the public sector.

	All	of which:		
		Employed	of which:	
			Public	Private
	(1)	(2)	(3)	(4)
Mean	41.6	49.6	57.4	47.7
Percentile 01	1.3	3.3	7.4	2.8
Percentile 02	3.4	6.0	11.1	5.4
Percentile 05	6.7	10.6	18.6	9.8
Percentile 10	9.9	14.9	24.1	13.9
Percentile 20	14.7	21.0	32.3	19.4
Percentile 30	19.5	26.6	38.2	24.4
Percentile 40	24.6	32.3	43.9	29.5
Percentile 50	30.5	38.4	50.3	35.2
Percentile 60	37.1	45.4	57.6	41.9
Percentile 70	45.2	54.4	66.4	50.5
Percentile 80	57.5	67.2	78.2	63.2
Percentile 90	79.6	90.5	98.1	87.5
Percentile 95	105.2	117.6	119.5	116.8
Percentile 98	148.8	163.2	150.1	168.2
Percentile 99	194.0	209.8	174.8	222.6
Share in population	90.6	58.0	11.7	46.3

Table 3. Composition of income

All statistics are computed using population weights by year, then averaged across all years. Income groups are defined by the income percentiles of the entire population. The sample includes all households with positive gross income, complete income information for all adult members, and at least one adult whose primary income source is labor income (wages and salaries, excluding job-loss indemnifications). Public-sector households are employed households in which the highest-earning adult is employed in the public sector; Private-sector households are employed households in which the highest-earning adult is not employed in the public sector.

Income (row (1)) is expressed in thousands of euros and deflated using the CPI (base year 2021). Shares (row (2)) are expressed as percentages. Proportions (rows (3)-(11)) are calculated relative to gross income and expressed as a percentage.

	All	Income group								
		≤1	1-5	5-20	20-40	40-60	60-80	80-95	95-99	> 99
					Public-sector households					
(01) Mean gross income	57.4	0.7	4.2	11.1	20.6	31.4	46.7	75.3	130.8	239.1
(02) Share in subpopulation	100.0	0.1	0.7	2.3	7.4	17.4	31.8	32.2	7.3	0.6
(03) Disposable income	78.7	76.0	86.2	91.0	84.3	80.5	78.8	76.7	73.1	68.8
(04) Labor income	87.1	95.4	84.7	76.7	88.2	89.8	88.0	86.2	83.3	80.1
(05) Real estate	1.5	0.0	0.2	0.4	0.5	0.8	1.4	2.1	3.1	3.9
(06) Business income	1.7	0.5	1.0	1.3	1.0	1.3	1.6	1.9	2.9	5.8
(07) Financial income	0.5	1.3	0.7	0.3	0.3	0.3	0.4	0.5	1.0	2.0
(08) Capital gains	0.5	0.7	0.6	0.6	0.3	0.3	0.4	0.6	1.2	2.4
(09) Other income	2.0	1.3	4.2	4.8	2.4	1.8	2.0	1.9	1.4	1.0
(10) Retirement benefits	4.7	0.0	0.3	0.8	1.9	3.5	4.7	5.8	6.6	4.4
(11) Unemployment benefits	2.1	0.7	8.3	15.1	5.4	2.2	1.6	1.0	0.5	0.4
					Private-sector households					
(01) Mean gross income	47.7	0.6	4.3	11.4	19.7	30.6	46.0	75.1	134.6	384.0
(02) Share in subpopulation	100.0	0.5	2.2	8.6	19.1	22.6	23.1	17.5	5.1	1.4
(03) Disposable income	82.9	73.5	83.7	89.1	86.5	85.1	82.3	78.2	73.1	68.5
(04) Labor income	75.0	94.9	82.3	76.6	77.9	75.5	74.3	72.5	70.1	61.0
(05) Real estate	1.7	0.1	0.3	0.4	0.7	1.1	1.8	3.0	4.8	5.1
(06) Business income	3.6	0.5	2.0	2.5	2.8	3.2	3.5	4.5	6.8	10.8
(07) Financial income	0.7	1.0	0.5	0.3	0.3	0.3	0.5	1.0	2.3	7.2
(08) Capital gains	0.8	0.5	0.6	0.5	0.5	0.4	0.6	1.1	2.8	6.9
(09) Other income	3.6	1.9	4.7	4.3	3.7	3.9	3.8	3.2	2.2	1.2
(10) Retirement benefits	9.6	0.1	0.9	4.4	7.0	10.3	12.2	12.5	9.0	5.2
(11) Unemployment benefits	5.0	1.0	8.6	11.0	7.1	5.1	3.4	2.4	2.0	2.6

Table 4. Distribution of wealth

All statistics are computed using population weights by year, then averaged across all years. Total wealth is expressed in thousands of euros and deflated using the CPI (base year 2021). Shares are in percent.

Column (1) includes all households with positive wealth and complete wealth information for all adult members. An individual's wealth information is defined as complete if all their non–real estate wealth items are non-missing, non-negative, and below €10 million.

Columns (2)-(4) include all households with positive wealth, complete wealth information for all adult members, and at least one adult whose primary income source is labor income (wages and salaries excluding job loss indemnifications). Public-sector households are employed households in which the highest-earning adult is employed in the public sector; Private-sector households are employed households in which the highest-earning adult is not employed in the public sector.

	All	of which:		
		Employed	of which:	
			Public	Private
	(1)	(2)	(3)	(4)
Mean	315.5	297.8	327.8	290.2
Percentile 01	0.1	0.1	1.1	0.1
Percentile 02	0.3	0.5	2.6	0.4
Percentile 05	1.2	1.5	8.9	1.2
Percentile 10	4.2	4.6	35.5	3.4
Percentile 20	36.9	34.0	99.0	20.9
Percentile 30	87.3	86.4	141.8	72.8
Percentile 40	129.9	127.4	183.2	113.7
Percentile 50	176.9	171.4	230.4	156.0
Percentile 60	235.8	226.2	287.9	208.7
Percentile 70	317.6	302.8	364.6	283.7
Percentile 80	444.1	422.8	477.8	404.7
Percentile 90	700.5	664.2	694.6	654.0
Percentile 95	1,027.7	968.3	948.1	974.4
Percentile 98	1,633.9	1,509.6	1,341.3	1,564.7
Percentile 99	2,299.3	2,097.5	1,714.5	2,212.0
Share in population	95.2	60.1	12.1	48.0

Table 5. Composition of wealth

All statistics are computed using population weights by year, then averaged across all years. Wealth groups are defined by the income percentiles of the entire population. The sample includes all households with positive total wealth and complete wealth information for all adult members, and at least one adult whose primary income source is labor income (wages and salaries, excluding job-loss indemnifications). An individual's wealth information is defined to be complete if all their non–real estate wealth items are non-missing, non-negative, and below €10 million. Public-sector households are employed households in which the highest-earning adult is employed in the public sector; Private-sector households are employed households in which the highest-earning adult is not employed in the public sector.

Total wealth (row (1)) is expressed in thousands of euros and deflated using the CPI (base year 2021). Shares (row (2)) are expressed as percentages. Proportions (rows (3)-(9)) are calculated relative to total wealth and expressed as a percentage. Risky assets (row (5)) are defined as holdings of publicly traded stocks, investment funds, and crypto assets (the latter included starting in 2023). Safe financial assets (row (6)) are defined as holdings of bonds, insurance products, and pension funds. The debt ratio in row (9) is calculated excluding households with a debt-to-wealth ratio above 10.

	All	Wealth group								
		≤1	1-5	5-20	20-40	40-60	60-80	80-95	95-99	> 99
		Public-sector households								
(01) Mean total wealth	327.8	0.0	0.7	13.7	89.3	180.6	325.0	639.5	1,379.5	3,334.7
(02) Share in subpopulation	100.0	0.2	0.9	9.0	17.0	23.9	26.4	18.4	3.7	0.4
(03) Deposits	22.1	94.2	72.9	65.1	22.8	15.6	16.0	15.9	14.5	11.6
(04) Financial assets	6.2	4.6	9.4	10.5	5.3	4.2	5.4	7.2	10.4	17.4
(05) of those—Risky	2.3	1.4	1.2	1.6	1.5	1.5	2.2	3.7	6.6	13.6
(06) of those—Safe	3.8	3.3	8.2	8.9	3.8	2.8	3.2	3.5	3.8	3.8
(07) Real estate	68.0	0.0	0.0	6.7	67.6	77.8	76.9	75.5	73.8	69.3
(08) Other assets	3.8	1.2	17.7	17.8	4.3	2.4	1.7	1.4	1.2	1.7
(09) Debt	29.0	5.9	44.8	70.7	44.8	31.2	19.4	10.4	5.2	3.0
		Private-sector households								
(01) Mean total wealth	290.2	0.0	0.6	10.7	86.4	177.9	323.5	648.3	1,429.5	4,178.3
(02) Share in subpopulation	100.0	1.0	4.2	17.9	20.9	20.1	18.2	13.2	3.6	0.9
(03) Deposits	25.5	95.3	75.2	60.2	16.0	12.2	13.6	13.8	12.8	11.8
(04) Financial assets	6.4	3.9	7.7	10.0	4.3	4.0	5.4	7.5	10.4	20.3
(05) of those—Risky	1.9	1.3	1.0	1.3	1.2	1.2	1.9	3.4	6.3	16.0
(06) of those—Safe	4.4	2.6	6.7	8.7	3.1	2.8	3.5	4.0	4.2	4.2
(07) Real estate	61.4	0.0	0.0	7.3	75.6	81.5	79.1	77.2	75.3	65.7
(08) Other assets	6.7	0.8	17.1	22.5	4.1	2.3	1.9	1.5	1.5	2.2
(09) Debt	35.4	5.1	40.9	69.8	46.4	31.2	19.3	12.0	7.6	5.3

Table 10. Estimated Parameters

Panel A. Estimated Parameters

Parameter	Private	Public
	Risk Aversion	
σ	1.14	1.49
	Discount Rate	
β	0.73	0.75
	Bequest Function	
ϱ_1	0.04	0.02
ϱ_2	0.00	0.00
	Borrowing Limit	
$\underline{b}$	-0.03	-0.04

Panel B. Model Fit

	MPC			
	Data	Model	Data	Model
Non-HtM	0.58	0.58	0.59	0.58
HtM	0.95	0.72	0.95	0.73

Table 11. Estimated Earnings Parameters, by Occupation

	Occupation	
Parameter	**Private**	**Public**
a_0	0.7153	0.9699
a_1	0.04309	0.0736
a_2	-0.00279	-0.00634
a_3	8.86e-05	2.23e-04
a_4	-9.48e-07	-2.57e-06
Permanent Std. Dev. (σ_α)	0.487	0.223
Persistence (ρ_z)	0.738	0.678
Persist Std. Dev. (σ_η)	0.075	0.013
Transitory Std. Dev. (σ_ϵ)	0.349	0.441

Note: Authors' calculations based on the Spanish Household Panel, 2016 - 2023.

Table 6. MPC (upper part) and changes in debt (lower part) by household type and HtM status

The table presents estimates from a regression of changes in log consumption on changes in log income, conditional on controls and city-year fixed effects. The sample includes all household-years with unchanging household composition, complete wealth information for all adult members, and at least one adult whose primary income source is labor income (wages and salaries, excluding job-loss indemnifications). Controls include the number of household members, the number of female members, the number of members with Spanish nationality, the number of members born in Spain, the number of children, and the number of older members (all modeled as categorical variables with values of 1, 2, or 3+ members). All controls and fixed effects, as well as the HtM indicator used in specification (2), are interacted with the household type.

Log differences in consumption and income are trimmed at the 1st and 99th percentiles. Sample size is 1.373.486 household-years. Standard errors are clustered by household and reported in parentheses.

HtM households are defined as those whose end-of-period cash balances fall below their monthly current income.

	(1)			(2)		
	Private	Public	Difference	Private	Public	Difference
Δy	0.706***	0.659***	−0.0466***			
	(0.0050)	(0.011)	(0.012)			
$\Delta y \times$ Not HtM				0.584***	0.588***	0.00391
				(0.0065)	(0.013)	(0.015)
$\Delta y \times$ HtM				0.952***	0.939***	−0.0130
				(0.0066)	(0.021)	(0.022)
City-year FE	Yes			Yes		
Controls	Yes			Yes		
R^2	0.17			0.18		
N	1373486			1373486		
	(1)			(2)		
	Priv.	Pub.	Dif.	Priv.	Pub.	Dif.
Δy	−0.0497***	−0.0892***	−0.0395***			
	(0.0034)	(0.0088)	(0.0094)			
$\Delta y \times$ Not HtM				−0.0513***	−0.0952***	−0.0439***
				(0.0039)	(0.0095)	(0.010)
$\Delta y \times$ HtM				−0.0450***	−0.0592***	−0.0142
				(0.0069)	(0.022)	(0.023)
City-year FE	Yes			Yes		
Controls	Yes			Yes		
R^2	0.11			0.11		
N	544365			544365		

Table 7. Income shocks and changes in total wealth (upper part) and financial assets (lower part) by household type and HtM status

The table presents estimates from a regression of changes in log total wealth on changes in log income, conditional on controls and city-year fixed effects. The sample includes all household-years with unchanging household composition, complete wealth information for all adult members, and at least one adult whose primary income source is labor income (wages and salaries, excluding job-loss indemnifications). Controls include the type of the household defined as the interaction of the number of household members, the number of female members, the number of members with Spanish nationality, the number of members born in Spain, the number of children, and the number of older members (all modeled as categorical variables with values of 1, 2, or 3+ members); the change in the number of children, older members and members with Spanish nationality; and five-year age bins of household head. All controls and fixed effects, as well as the HtM indicator used in specification (2), are interacted with the household type.

Log differences in total wealth and income are trimmed at the 1st and 99th percentiles. Standard errors are clustered by household and reported in parentheses.

HtM households are defined as those whose end-of-period cash balances fall below their monthly current income.

	(1)			(2)		
	Priv.	Pub.	Dif.	Priv.	Pub.	Dif.
Δy	0.0980***	0.0945***	−0.00348			
	(0.0038)	(0.0071)	(0.0081)			
$\Delta y \times$ Not HtM				0.110***	0.101***	−0.00910
				(0.0039)	(0.0074)	(0.0084)
$\Delta y \times$ HtM				0.0544***	0.0501**	−0.00431
				(0.011)	(0.021)	(0.024)
City-year FE	Yes			Yes		
Controls	Yes			Yes		
R^2	0.13			0.13		
N	994407			994407		
	(1)			(2)		
	Priv.	Pub.	Dif.	Priv.	Pub.	Dif.
Δy	0.0469***	−0.0123	−0.0592***			
	(0.0088)	(0.019)	(0.021)			
$\Delta y \times$ Not HtM				0.0470***	−0.0145	−0.0614***
				(0.0092)	(0.020)	(0.022)
$\Delta y \times$ HtM				0.0492	0.0303	−0.0190
				(0.032)	(0.099)	(0.10)
City-year FE	Yes			Yes		
Controls	Yes			Yes		
R^2	0.18			0.18		
N	311594			311594		

Table 8. Income shocks and changes in real estate wealth (upper part) and risky financial assets (lower part) by household type and HtM status

The table presents estimates from a regression of changes in log real estate wealth on changes in log income, conditional on controls and city-year fixed effects. The sample includes all household-years with unchanging household composition, complete wealth information for all adult members, and at least one adult whose primary income source is labor income (wages and salaries, excluding job-loss indemnifications). Controls include the type of the household defined as the interaction of the number of household members, the number of female members, the number of members with Spanish nationality, the number of members born in Spain, the number of children, and the number of older members (all modeled as categorical variables with values of 1, 2, or 3+ members); the change in the number of children, older members and members with Spanish nationality; and five-year age bins of household head. All controls and fixed effects, as well as the HtM indicator used in specification (2), are interacted with the household type.

Log differences in real estate wealth and income are trimmed at the 1st and 99th percentiles. Standard errors are clustered by household and reported in parentheses.

HtM households are defined as those whose end-of-period cash balances fall below their monthly current income.

	(1)			(2)		
	Priv.	Pub.	Dif.	Priv.	Pub.	Dif.
Δy	−0.00978***	−0.0192***	−0.00942***			
	(0.0011)	(0.0027)	(0.0029)			
$\Delta y \times$ Not HtM				−0.0112***	−0.0206***	−0.00947***
				(0.0012)	(0.0029)	(0.0031)
$\Delta y \times$ HtM				−0.00298	−0.00711	−0.00412
				(0.0024)	(0.0065)	(0.0069)
City-year FE	Yes			Yes		
Controls	Yes			Yes		
R^2	0.27			0.27		
N	782645			782645		
	(1)			(2)		
	Priv.	Pub.	Dif.	Priv.	Pub.	Dif.
Δy	0.0277***	0.0121	−0.0156			
	(0.0039)	(0.0092)	(0.0100)			
$\Delta y \times$ Not HtM				0.0275***	0.00987	−0.0176*
				(0.0043)	(0.0098)	(0.011)
$\Delta y \times$ HtM				0.0301***	0.0334	0.00328
				(0.0094)	(0.026)	(0.028)
City-year FE	Yes			Yes		
Controls	Yes			Yes		
R^2	0.11			0.11		
N	582086			582086		

Table 9. Income shocks and changes in holdings of safe financial assets (upper part) and cash holdings (lower part) by household type and HtM status

The table presents estimates from a regression of changes in log holdings of safe financial assets on changes in log income, conditional on controls and city-year fixed effects. The sample includes all household-years with unchanging household composition, complete wealth information for all adult members, and at least one adult whose primary income source is labor income (wages and salaries, excluding job-loss indemnifications). Controls include the type of the household defined as the interaction of the number of household members, the number of female members, the number of members with Spanish nationality, the number of members born in Spain, the number of children, and the number of older members (all modeled as categorical variables with values of 1, 2, or 3+ members); the change in the number of children, older members and members with Spanish nationality; and five-year age bins of household head. All controls and fixed effects, as well as the HtM indicator used in specification (2), are interacted with the household type.

Log differences in assets and income are trimmed at the 1st and 99th percentiles. Standard errors are clustered by household and reported in parentheses.

HtM households are defined as those whose end-of-period cash balances fall below their monthly current income.

	(1)			(2)		
	Priv.	Pub.	Dif.	Priv.	Pub.	Dif.
Δy	0.0124***	0.0123*	−0.000157			
	(0.0029)	(0.0073)	(0.0078)			
$\Delta y \times$ Not HtM				0.0116***	0.0140*	0.00235
				(0.0032)	(0.0077)	(0.0083)
$\Delta y \times$ HtM				0.0177**	−0.000297	−0.0180
				(0.0069)	(0.021)	(0.022)
City-year FE	Yes			Yes		
Controls	Yes			Yes		
R^2	0.14			0.14		
N	501133			501133		
	(1)			(2)		
	Priv.	Pub.	Dif.	Priv.	Pub.	Dif.
Δy	0.563***	0.582***	0.0195			
	(0.0090)	(0.017)	(0.019)			
$\Delta y \times$ Not HtM				0.572***	0.581***	0.00937
				(0.0083)	(0.015)	(0.017)
$\Delta y \times$ HtM				0.545***	0.674***	0.128
				(0.032)	(0.090)	(0.095)
City-year FE	Yes			Yes		
Controls	Yes			Yes		
R^2	0.12			0.15		
N	954273			954273		

Figure 1. Deterministic Earnings Profiles by Occupation. Authors' calculations based on the Spanish Household Panel, 2016 - 2023.

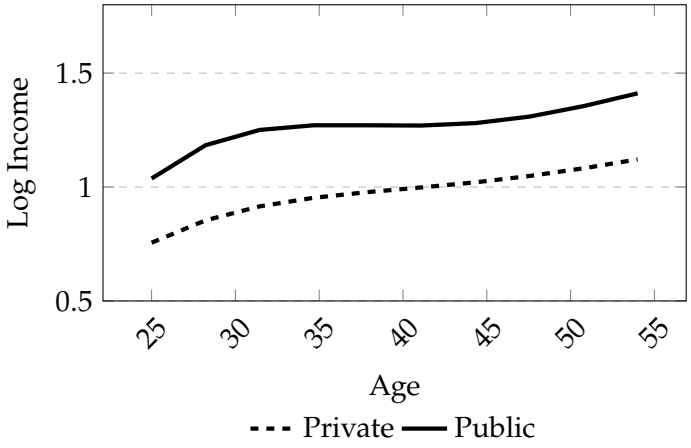


Table 12. Estimated Earnings Moments by Occupation

	Private		Public	
Moment	Data	Model	Data	Model
Average Income (ages 25 - 64)	3.42	3.56	4.37	4.30
p90/p10 (ages 25 - 34)	5.08	4.98	4.29	3.78
p75/p25 (ages 25 - 34)	2.43	2.32	2.11	2.02
p90/p10 (ages 40 - 49)	4.72	4.87	3.39	3.56
p75/p25 (ages 40 - 49)	2.31	2.29	1.88	1.98
p90/p10 (ages 25 - 64)	5.01	5.09	3.73	3.81
p75/p25 (ages 25 - 64)	2.39	2.35	1.99	2.03

Note: Data moments are author's own calculations based on the Spanish Household Panel, 2016 - 2023.

Table 13. Counterfactual Scenarios

MPC				
	Private	**Public**		
	Benchmark	Benchmark	Same Preferences	Same Income Level
Non-HtM	0.58	0.58	0.64	0.56
HtM	0.72	0.73	0.82	0.73

Note: Data moments are authors' calculations based on the Spanish Household Panel, 2016 - 2023.

Online Appendix (For Online Publication Only)

Latent Prudence or Anticipation of Shocks: Evidence from Near-Zero Risk Jobs

Faia, Khametshin, Lopez-Rodriguez, Nuno and Pidkuyko

March 25, 2026

A Definition and Variable Construction

Below, we describe the main variables and their components available in our datasets, as well as how we construct consumption and compute asset valuations, including residential wealth.

Variable Definition Gross Income (GI)is the sum of 6 income categories: Labor income (wages, pensions, unemployment payments), Financial capital income (interests, dividends), Real estate capital income (rental income), Business income (baseline only self-employed – we add also a proxy of corporate income [see below]), Other income (transfers and subsidies from Social Security-SS), Realized capital gains (income calculated as the difference between the sale price at t and the acquisition price of assets at t-x, net of associated expenses [not including taxes]).

Net Income (NI) is the GI adjusted from direct taxes payments plus social security contributions, hence it is given by: NI = GI – PIT payments – Social Security Contributions (at the expense of the worker). Note that the PIT payment refers to the tax due on aggregate taxable income, including capital gains.

Payment of interests (INT). We have information on the end-of-year balance of total debts and liabilities for individuals (mortgages and most consumer loans, excluding credit cards): Liabilities (LI). We use Bank of Spain data on the average/end of the year cost of household outstanding debt (r) to approximate the annual interest payment: INT=r*LI (potential future merge with BdE CIR data). Note that differences between average and end-of-year costs are marginal, except in 2022 and 2023. For now, we use average cost because it seems more suitable for approximating the annual interest payment.

Budget Constraint. Net income less interest payment equals the sum of consumption and savings. We use our data on asset and debt stocks to approximate savings and then calculate consumption, such as the difference between NI, INT, and savings. We then obtain:

Consumption = NI-INT- Savings.

Computation of Savings. Our dataset includes the end-of-the-year annual balance of several types of assets and total debts and liabilities of individuals. The assets include: Cash, Urban real estate assets (main house + other residential houses + other assets), Other real assets (land, rural assets), Financial assets, Stocks, Bonds and debt, Investment funds, Pension funds, Guaranteed income and insurance, Other assets (for rich people top 1%: jewelry, yachts, cars, art, etc.).

Proxy of residential housing market values. Note that data on urban real estate assets is not end-of-year but average administrative values. We received a microdataset with start and end dates of home ownership for each urban real estate asset. We extract urban real estate assets from those properties that are not in the portfolio as of December 31st. To compute residential housing market values, we use data on house characteristics (surface area and location) and average house prices per m2 from the Bank of Spain. We used average prices per m2 at the district level (better than municipality-level; potentially relevant within big cities such as Madrid and Barcelona) + consumption/savings analysis. Pending inclusion in future iterations, the adjustment of quality: we are valuing the stock of housing, but we have data on flows of acquisitions (different sizes, quality, etc.).

Valuation of financial assets. We have end-of-year market valuations for stocks, investment and pension funds, but acquisition prices for bonds and debt, and for guaranteed income and insurance. Other assets of rich people are valued under the wealth tax valuation rules. In this item, we are capturing the durable goods of the top wealth individuals. Importantly, we note that we only observe aggregated realized capital gains.