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## INCOME INEQUALITY, HOUSEHOLD CONSUMPTION AND STATUS COMPETITION IN GERMANY

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### ABSTRACT

We analyse the decline of household saving rates in the bottom half of the income distribution in Germany since the 2000s, which allowed for only moderately increasing consumption inequality, despite sharply rising income inequality. We combine survey data on household consumption with our own representative survey on the visibility and status relevance of various spending categories to test for upwards directed social status comparisons as an explanation of these trends. We find that non-rich households shift their income allocations towards more visible and status relevant areas of consumption when incomes at the top rise relative to their own. Renter households offset higher status consumption by reducing expenditures on other consumption components. In contrast, homeowners maintain higher status-oriented expenditures, particularly regarding housing, by considerably reducing their saving rates.

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# Income Inequality, Household Consumption and Status Competition in Germany\*

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## Abstract

We analyse the decline of household saving rates in the bottom half of the income distribution in Germany since the 2000s, which allowed for only moderately increasing consumption inequality, despite sharply rising income inequality. We combine survey data on household consumption with our own representative survey on the visibility and status relevance of various spending categories to test for upwards directed social status comparisons as an explanation of these trends. We find that non-rich households shift their income allocations towards more visible and status relevant areas of consumption when incomes at the top rise relative to their own. Renter households offset higher status consumption by reducing expenditures on other consumption components. In contrast, homeowners maintain higher status-oriented expenditures, particularly regarding housing, by considerably reducing their saving rates.

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## 1. Introduction

Income inequality in Germany started to rise substantially in the early 2000s (Biewen and Juhasz, 2012; Fuchs-Schündeln et al., 2010; OECD, 2008), primarily driven by declining real incomes of households in the bottom half of the income distribution. Consumption inequality rose far less, as lower-income households maintained relatively high consumption levels despite falling incomes (Fuchs-Schündeln et al., 2010). Recent work suggests that disproportionately increasing housing expenditures of lower-income households played a key role in explaining the comparatively small rise in consumption inequality relative to income inequality (Dustmann et al., 2022). These developments were associated with reduced saving by lower-income groups. The resulting spread of saving rates along the income distribution can have far-reaching implications for wealth inequality, as Saez and Zucman (2016) show for the U.S. context. In this paper, we explore the role of rising income inequality for household consumption behaviour in Germany, specifically in explaining the relatively modest increase in consumption inequality and the disproportionate decrease of saving rates among lower-income households. We combine household micro-data from the German Income and Expenditure Survey (EVS) and the Socio-Economic Panel (SOEP) with information from our own survey on interpersonal consumption comparisons to investigate the role of status seeking in private consumption behaviour as a potential explanation of these trends.

Social status comparisons allow for a direct link between rising incomes or consumption at the top of the distribution and spending of the non-rich (Bertrand and Morse, 2016; Frank et al., 2014; Veblen, 2009). Theories of expenditure cascades or trickle-down consumption build on the relative income hypothesis (Duesenberry, 1949) and the notion of upward-facing interpersonal comparisons to suggest a causal link between rising income inequality and private consumption-saving behaviour, by deeming households status-seeking. As income inequality increases, richer households can uphold higher consumption expenditures, thereby shifting the frame of reference for those falling behind. With reference consumption being deterministic of own consumption, those with relative income losses will spend a larger share of their income to maintain their relative consumption position, especially in areas perceived as most relevant to socioeconomic status. This can lead to lower spending on non-positional (yet welfare-enhancing) consumption goods and reduced saving.

We conducted a survey on consumption visibility and status relevance to identify areas of consumption where social comparisons matter most. Our large sample of more than 1800 individuals is representative of Germany’s population along key sociodemographic characteristics. We expand prior visibility surveys (Charles et al., 2009; Heffetz, 2011) by introducing a novel measure of status relevance. This measure incorporates how competitive advantages from higher relative consumption are reflected in different items. Thereby, it complements conventional visibility measures that primarily operationalise signalling

motives. Our survey includes saving as another use of disposable income to provide a more comprehensive picture of household resource allocations. We find that saving is less visible than all of the consumption goods yet ranks at the upper end of the status relevance scale, where it is only surpassed by housing, holiday and vehicle consumption. Hence, a saving rate reduction in favour of higher consumption expenditures only implies a more status relevant income allocation if additional spending is devoted to these three areas. In turn, foregoing savings for the sake of consumption will always result in a more visible use of disposable income.

We next employ the EVS for a detailed analysis of household consumption. In contrast to previous work by Dustmann et al. (2022), we show that the reduction in saving rates at the lower end of the income distribution was largely driven by low-income homeowners (as opposed to renters). Owner-occupiers most strongly expanded their income shares allocated to housing consumption alongside rising income inequality, despite falling house prices (relative to rents) and mortgage interest rates. We find that consumption-saving behaviour of these households directly correlates with the rise in income inequality. Based on state-year variation in incomes of the rich, we show that spending out of income of a given non-rich homeowner is positively related to rising income or consumption expenditures of households at the top of the distribution. Non-rich owner-occupiers spend larger shares of their income and save less, holding own incomes and other sociodemographic characteristics constant.

We break down overall consumption into various components to identify whether households systematically reallocate their resources when incomes at the top of the distribution rise relative to their own. Assigning our survey measures yields that all non-rich households shift their income allocations towards more visible and status relevant consumption components. Renter households offset higher status consumption by reducing spending on other items, while keeping status relevant saving rates constant. In contrast, homeowners considerably reduce their saving rates to maintain higher status-oriented expenditures. This behavioural influence of rising inequality on households' consumption-saving decisions is particularly detrimental to the saving rates of homeowners at the bottom of the income distribution, who took on substantial financial burdens to maintain their aspired relative standard of living. We show that this saving rate reduction is entirely in favour of a spending expansion in the even more status relevant categories, with expenditures on residential property accounting for the largest share. Hence, the decision to trade off status relevant savings for an improved relative consumption position hinges on the measure of status relevance, highlighting the role of competitive advantages from an improved relative standing. On the other hand, neither homeowners nor renters were willing to reduce saving rates for purely visible consumption.

We conduct a series of robustness tests to rule out competing explanations of our estimated relationship between rising top incomes and non-rich homeowners' spending

out of income. Our results based on the EVS oppose alternative explanations relying on home equity or a local price channel. Employing the SOEP for its panel component we show that residential mobility and the permanent income hypothesis and life-cycle theory of consumption cannot explain our findings.

Presuming that the estimated relationship does indeed represent a causal mechanism, we assess the economic magnitude of the effect on non-rich saving. Our counterfactual calculations suggest that by 2018 saving rates of homeowners in the first quintile of the income distribution would have been 5.5 percentage points higher, had incomes at the top not grown at a faster rate than their own.

Our paper adds to research on status competition and trickle-down consumption effects, which has mostly focused on the U.S. (Bertrand and Morse, 2016; Charles et al., 2009; Frank et al., 2014; Maurer and Meier, 2008). We find that status consumption effects in Germany were more limited vis-à-vis the U.S., where rising income inequality was primarily driven by an explosion of top income shares (Piketty and Saez, 2006). Whereas rising income inequality was associated with falling saving rates for all but the richest households in the U.S. (Saez and Zucman, 2016), in Germany the decrease in saving was concentrated among households in the bottom half of the income distribution. Our results also relate to evidence that has highlighted the relevance of status comparisons to consumption and saving decisions in various other country contexts (Agarwal et al., 2020; Georgarakos et al., 2014; Kuhn et al., 2011; Quintana-Domeque and Wohlfart, 2016).

Our findings complement the relatively limited microeconomic evidence indicating that status comparisons are present in consumption behaviour of private households in Germany (Drechsel-Grau and Schmid, 2014; Friehe and Mechtel, 2014). However, the role of these effects in explaining overall trends in consumption and saving under surging income inequality over recent decades is not well understood. We demonstrate how status seeking limited the rise in consumption inequality and contributed to falling saving rates of lower-income households.

Prior studies on the role of social comparisons for household consumption based on nationally representative datasets relied on visibility measures to identify areas where social comparisons matter most (Bertrand and Morse, 2016; Charles et al., 2009; Friehe and Mechtel, 2014; Quintana-Domeque and Wohlfart, 2016). Hence, their analyses were restricted to conspicuous consumption and associated signalling motives, not accounting for other aspects of an improved relative standing, such as competitive advantages. The latter are incorporated by our new measure of status relevance, which we find to be key for understanding changes in consumption-saving behaviour due to concerns about relative standing.

Our study also contributes to the literature on the interplay between income inequality and housing markets. Previous research for Germany suggested that rising housing expenditure shares, particularly for low-income renters, amplified trends in income in-

equality and impeded wealth accumulation (Dustmann et al., 2022). Instead, we show that the increase in expenditure shares on housing was largest for homeowners, whose saving rates declined substantially relative to their renter counterparts. Our findings imply that homeowners were more strongly affected by the rise of income inequality (net of housing expenditures) than renter households.

The remainder of this paper is structured as follows. In Section 2, we describe the employed datasets. In Section 3, we document key developments of income inequality, private household consumption and saving. Our empirical analysis on the link between rising income inequality and household consumption is presented in Section 4 and Section 5 concludes.

## 2. Data

### 2.1. Household Data

Our primary data source is the German Income and Expenditure Survey (Einkommens- und Verbrauchsstichprobe, EVS), which is carried out quinquennially by the Federal Statistical Office of Germany.<sup>1</sup> The EVS consists of repeated cross-sections, with about 40,000 to 50,000 households participating each wave. Our analysis employs the waves from 1998 to 2018, which we harmonise to construct a consistent cross-sectional dataset of household consumption.<sup>2</sup> Besides the large sample size, the main advantage of this dataset is the highly detailed account of household expenditures. This allows us to divide consumption expenditures into 18 distinct categories for parts of our analysis. Table A1 of the appendix provides a detailed description of the individual components from which we assemble these categories.

Total household consumption is measured as the sum of all private consumption expenditures.<sup>3</sup> House purchases are excluded from total consumption. Instead, we define housing consumption of owner-occupiers as expenditures on maintenance and repairs<sup>4</sup>, operating costs, and mortgage interest payments for the owner-occupied home.<sup>5</sup> Unlike

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<sup>1</sup>A detailed documentation of the EVS waves is available at the Federal Statistical Office of Germany (2008*a,b*, 2012, 2016, 2021).

<sup>2</sup>We do not include earlier waves due to far-reaching changes in survey mode, structural breaks, and ensuing concerns about comparability of the data.

<sup>3</sup>This measure is slightly lower than total household expenditures, as a small number of expenditure items is neither classified as consumption nor income deduction. These include mostly non-specified miscellaneous tax payments, some private insurance premia, interest payments for consumer loans and interest on mortgages for non-owner-occupied properties.

<sup>4</sup>Despite relying on the same dataset, we document different developments of household consumption and particularly expenditures on housing than Dustmann et al. (2022). Most of the difference arises as we correct for a structural break in the EVS questionnaire that is unaccounted for by Dustmann et al. (2022), which would otherwise make expenditures on home repairs of the 1998 and 2003 waves incommensurable with all later waves. Unlike Dustmann et al. (2022) we omit the 1993 wave of the EVS, as it is categorically incomparable with all subsequent waves.

<sup>5</sup>In the 1998 and 2003 waves of the EVS mortgage interest payments for owner-occupied housing are only documented in combination with other mortgage interest payments for non-owner-occupied housing.

related contributions (e.g., Bertrand and Morse, 2016), we do not include mortgage repayments into our measure of housing consumption, as they are debt repayment and should thus be considered as saving. For renters, housing consumption is measured as rent paid and expenses on smaller repairs that were carried out on own account. Housing benefits enter our measure of income and housing consumption. In contrast to Dustmann et al. (2022) we consider housing expenditures and energy costs separately, as they pose distinct decisions to consume despite being closely related.

Our disposable income variable is calculated as the sum of wage income, capital income, public and private transfers, income from subletting, and from the sale of goods, net of taxes and social security contributions. We calculate residual savings as disposable household income net of all private expenditures.

Parts of our analyses require a panel structure. Since the EVS consists of repeated cross-sections, we additionally utilise the Socio-Economic Panel (SOEP), a yearly, longitudinal panel dataset, representative of the German population. We construct all our variables following the same definitions as for the EVS.

## 2.2. Visibility and Status Relevance

We supplement the EVS with our own survey, to operationalise the extent to which concerns about relative standing might be reflected in different categories of private consumption. We conduct an online survey among a large sample of 1829 individuals, representative of the German population along key sociodemographic characteristics. We split the sample into two groups with 917 participants answering a question on consumption visibility and the other 912 answering a question on status relevance.<sup>6</sup>

Our survey questions are designed to capture two distinct aspects that constitute the desirability of an improved relative consumption position (see Heffetz and Frank (2011) for a theoretical discussion). Going back to Veblen’s (2009) concept of conspicuous consumption, the utility that households derive from their current consumption depends directly on how their visible expenditures compare to those of others. More visible consumption allows households to signal their financial well-being as an end in itself, reflecting a consumption value of an improved relative standing (Heffetz and Frank, 2011). The more observable a consumption good is in social interactions, the more suitable it is as a signal and the more satisfaction or utility can be derived from higher consumption relative to others. Following Heffetz (2011), we measure visibility by asking respondents how quickly

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We rely on information from the remaining three waves to impute the amount of interest payments for the mortgage of the owner-occupied house. Further information is available in Appendix B. This is an additional aspect where our definition of housing consumption deviates substantively from that of Dustmann et al. (2022), who classify all mortgage interest payments as housing consumption of a given household, irrespective of whether they are for the mortgage on an owner-occupied residential property or not.

<sup>6</sup>Further information on our survey mode and sample, balance tests for the two subsamples and the full text of our questions are provided in Appendix B.

they would notice above average expenditures on each of our 18 categories upon meeting someone from another household similar to theirs. We code answers ranging from “Never” to “Immediately” and translate them into a measure ranging from 0 to 1.

On the other hand, we can regard status as a long-term investment in social or human capital. Higher relative consumption can have an asset or instrumental value (Heffetz and Frank, 2011), in so much as a household’s current relative consumption position determines future income. Our second measure is designed to incorporate this instrumental value and comes from a question asking respondents whether they perceive above average expenditures of households similar to theirs in any of our categories as a symbol for higher status. The question is conditional on having noticed higher expenditures and thus captures the status relevance of a given category irrespective of its observability and the resulting suitability as a signal. It goes beyond the visibility measure by recognising competitive or positional advantages associated with an improved relative consumption position (Frank, 2008). We translate answers ranging from “Absolutely not” to “Absolutely” into a measure of status relevance that lies between 0 and 1.

Table 1 reports the resulting indices of visibility and status relevance. In Figure 1 we plot the visibility index against the index of status relevance. An important result of our survey is our respondents’ assessment of the category saving. Unsurprisingly saving is the least visible of our categories yet is highly rated when it comes to status relevance. Saving is the only usage of disposable income that is entirely unobservable to others unless households actively share information. Additionally, higher saving is associated with lower consumption expenditures and thus a less visible overall income use, thereby opposing any signalling intentions. Thus, saving poses an important decision for households engaged in positional competition. They can either reduce their saving rate in favour of higher visibility through consumption or hold back on visible spending for higher status-enhancing savings.

The only categories that are perceived as more status relevant than saving are vacations, housing, and vehicles. If higher consumption expenditures relative to income and the following reduction of saving rates are status-driven, then we can expect additional expenditures to be exclusively allocated to these three categories. Only then higher consumption relative to income would have a positive net effect on the status relevance of overall income uses. Higher spending in all other categories would result in a reduction in the average status relevance of disposable income uses if savings were reduced symmetrically.

### **3. Income Inequality, Consumption and Saving in Germany**

We next take a closer look at income, consumption and saving of private households in Germany. Figure 2 shows the percent change of disposable incomes, household consump-



tion, and saving rates by quintile of the income distribution for the period between 1998 and 2018. Personal income inequality in Germany rose substantially during the 2000s. Stagnating or falling real incomes of households in the lower half of the distribution until 2013 were associated with strongly declining relative incomes and led to widening income differentials. Lower-income households did not reduce their consumption expenditures in proportion to their falling incomes and instead maintained absolute as well as relative consumption levels by reducing their saving rates. This trend was only reversed between 2013 and 2018, when real incomes and saving rates started to rise again for all quintiles. Saving rate reductions were strongest for income groups with the largest income losses relative to the top, allowing for a much smaller increase in consumption inequality than income trends would suggest. This led to a persistent divergence of saving rates along the income distribution, which is observable throughout the entire period between 1998 and 2018.

Differential trends in household saving were previously documented by Dustmann et al. (2022), who link them to disproportionately rising income shares allocated to housing among low-income households. The authors document a larger overall increase in absolute housing and energy expenses of renters between 1993 and 2013 and a higher share of renters among low-income households, for whom rent increases supposedly led to higher housing expenditures, whereas homeowners benefitted from falling mortgage interest rates. Arguing with differential changes in the cost of housing for homeowners versus renters, they conclude that rising income shares on housing and energy and the falling saving rate at the bottom of the income distribution must have been caused by renter households.

While Dustmann et al. (2022) refrain from conducting actual separate descriptive analysis for homeowners and renters by income quintile, we provide descriptive evidence on consumption and saving of low-income homeowners and renters that is inconsistent with their interpretation. Instead, we show that especially low-income homeowners strongly reduced their saving rates, which accounts for the brunt of the overall saving rate reduction (Figure 3b).<sup>7</sup> In stark contrast to homeowner households, the subpopulation of renters in the lowest quintile of the income distribution maintained constant saving rates (Figure 3a).

To better understand these trends, we next take a closer look at income allocations on various consumption components and saving of homeowners versus renters along the quintiles of the income distribution (Figure 4).<sup>8</sup> The substantial saving rate reduction of

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<sup>7</sup>Saving rates of outright homeowners are at slightly lower levels and decline to a larger extent than for those with an outstanding mortgage. Differences in levels are likely attributable to mortgage repayment, which is saving, dropping to zero as households become outright owners. Furthermore, the significantly higher age of outright owners made them more prone to dissaving at older age, as the average age rose for all households in our sample. In turn, the share of mortgage repayment in annuities increases as a mortgage matures, mechanically increasing saving rates of owners with an outstanding mortgage.

<sup>8</sup>The depicted components are constructed analogously to our consumption categories described in Ta-

low-income owner-occupiers is mostly accounted for by rising housing and energy expenditures, which increased relative to disposable income and in absolute terms. Between 1998 and 2008, the period which marks the highest increase in income inequality, equivalised annual housing expenditures of homeowners in the lowest quintile rose by roughly 38.6% from 1,378 to 1,910 euros. As a result, the share of disposable incomes allocated to housing rose by 6.4 percentage points before peaking at 18.7% in 2008. During the same period energy expenses of homeowners in the lowest quintile increased by 402 euros, from an initial 1,048 euros, eating up another 4.8% of disposable household incomes. The combined increase of housing and energy expenditures of homeowners between 1998 and 2008 amounts to 934 euros or an additional 11.2% of disposable household incomes, making it a total of 32.9%. During the same period renters in the first quintile increased their equivalised expenditures on housing by 11.2% from 3,274 to 3,642 euros and their energy expenses rose on average by a much more modest 89 euros, jointly accounting for an additional 7.2% of disposable household income, which equals 457 euros. Hence between 1998 and 2008 owner-occupiers in the first quintile increased their combined housing and energy expenditures by more than twice as much as renters.

The combined increase in housing and energy costs for low-income owner-occupiers alone can account for almost all of the simultaneously occurring reduction in saving rates from -6.5% in 1998 to -15.9% in 2008. Unlike homeowners, renter households in the first quintile maintained their saving rates, despite rising housing and energy expenditures, by reducing their expenditures on nearly all other consumption components.

For owner-occupiers in higher income groups these consumption and saving patterns are more attenuated. Compared to the first quintile, owner-occupiers in the second and third quintile of the income distribution decreased their saving rates to a much lesser extent, while the upper two quintiles had relatively stable saving rates. The absolute increase in housing and energy expenditures of homeowners in the first quintile between 1998 and 2008 is only surpassed by households in the top quintile. By 2013 homeowners in the lowest quintile had increased their expenditures by more than any other quintile.

Spending on housing and energy by renters was closely aligned along the income distribution, with renters in the first income quintile at the lower end. Nevertheless, income shares increased most for low-income households, as the increase of absolute expenditures was nearly uniform along the income distribution. Unlike for owner-occupiers the spending expansion of renters in the respective quintiles barely coincided with relative income losses and the rise in income inequality. Dustmann et al. (2022) convincingly argue that

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ble A1. To keep the figure overseeable we summarise some of the smaller categories. Specifically, we combine the two food categories with alcohol & tobacco. We sum up entertainment services and durables, combine health with education, as well as telephone & internet with books. The component “Other” includes expenditure items that are neither classified as consumption nor treated as income deductions. “Non-assigned” represents a small number of consumption items that did not match any of our categories.

the increase in housing income shares of renters and particularly low-income renters is mostly explained by price developments, sociodemographic composition effects and adverse income developments of lower-income households. These explanations are consistent with renters reducing non-housing consumption instead of savings to offset higher housing costs.

However, the analysis by Dustmann et al. (2022) disregards developments for low-income homeowners that are much more crucial in understanding the reduction of saving rates in the bottom half of the distribution. We documented substantial housing expenditure increases and saving rate reductions of lower-income homeowners far beyond those of renters, despite decreasing housing costs relative to rental prices (Figure 5) and falling mortgage interest rates (Figure 6), which raises the question why homeowners increased housing expenditures and income shares at the expense of their savings by so much more than renters. Interestingly, the striking difference in housing consumption and saving between homeowners and renters is restricted to income groups that were adversely affected by rising income inequality and corresponds to the magnitude of relative income losses with regards to the top. We suspect that rising income inequality and associated relative income losses of low-income households were a central contributing factor by inducing behavioural changes, particularly regarding homeownership.

## 4. Empirical Analysis

### 4.1. Income Inequality and Non-Rich Consumption

In this section we study whether rising income inequality is in fact associated with higher spending out of income for lower-income households. We start by estimating a regional income distribution for each state and year and restricting our sample to households below the 80th percentile.<sup>9</sup> We borrow our terminology from Bertrand and Morse (2016) by referring to households below the 80th percentile as non-rich and those above as rich. We then analyse how the expenditures of a given non-rich household respond to rising incomes (or consumption) of the rich.<sup>10</sup> We conduct subsample analyses for homeowners and renters, as understanding their distinct consumption and saving behaviour (particularly at the bottom of the income distribution) is key to explaining overall saving rate developments. Building on the empirical model by Bertrand and Morse (2016), we regress non-rich households' consumption out of income on income (or consumption) of the rich and a set of sociodemographic characteristics:

$$c_{ist} = \alpha + \beta \ln(\bar{y}_{st,p=0.80}) + \gamma X_{ist} + \delta I_{ist} + \Theta_s + \mu_t + \varepsilon_{ist} \quad (1)$$

<sup>9</sup>Due to relatively small sample sizes, we group the three city-states Hamburg, Berlin, and Bremen, as well as the Saarland with adjacent states.

<sup>10</sup>We also estimate specifications with consumption of the rich as our explanatory variable, as our suggested causal mechanism relies on consumption comparisons to explain higher spending of the non-rich.

The dependent variable  $c_{ist}$  is total private consumption expenditure as a share of disposable household income of a given non-rich household  $i$  in state  $s$  and year  $t$ . The explanatory variable of interest  $\bar{y}$  is the natural logarithm of the average household income at the 80th (or 90th) percentile of the state-year income distribution. We alternatively use consumption of (very) rich households as our key explanatory variable, which is defined as the natural logarithm of average consumption expenditures of all households above the 80th (or 90th) percentile in a given state and year.

$X$  is a set of standard sociodemographic characteristics. Specifically, we control for the gender and age of the household head, as well as a quadratic term of the age, marital status and professional education of the household head, the number of children and adults living in the household, a household’s homeowner status, an indicator for whether the household lives in a rural, urbanised or agglomeration area and a dummy for household heads with a German citizenship. Following Bertrand and Morse (2016), we nonparametrically control for own income represented by variable  $I$ , which is an indicator in buckets of 2,000 Euros of annual disposable household income. All estimations include state and year fixed effects. We cluster robust standard errors at the regional level and apply cross-sectional population weights.

Results are reported in Table 2.<sup>11</sup> We find evidence that rising incomes at the top of the distribution are significantly positively related to non-rich households’ consumption expenditures relative to disposable income, holding own incomes and other household characteristics constant. According to the estimate in Column 1 of Table 2, consumption of non-rich households as a share of disposable income is on average 0.11 percentage points higher for each 1% increase in incomes at the 80th percentile of the regional income distribution. We obtain a similar result when we employ the logarithm of the average household income at the 90th percentile as our explanatory variable of interest in Column 2. The estimated association is robust to the inclusion of state-specific time trends (Column 3) and the state unemployment rate (Column 4). In Columns 5 to 8 we conduct separate analyses for our subsamples of non-rich renters and homeowners. We find that the positive estimates in Columns 1 to 4 are exclusively driven by non-rich owner-occupiers. A given non-rich homeowner household spends an additional 0.27 percentage points of their disposable income with each 1% increase in the incomes of the rich, holding own incomes constant (Column 7). Again, this result is robust to the inclusion of state-specific time trends (Column 7) and the state unemployment rate (Column 8). The estimated coefficients on  $\text{Log}(80\text{thPercentileIncome})$  for the subsample of renters in Columns 5 and 6 are not significantly different from zero.

Our proposed theoretical status comparison mechanism hinges on the consumption of

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<sup>11</sup>Due to space limitations Table 2 and all other tables containing regression output only show the estimated coefficients on our key variables of interest. For completeness we additionally report the estimated coefficients on all our sociodemographic control variables from Columns (1) to (4) of Table 2 in Table A2 of the appendix.

the rich, as we argue that non-rich households increase consumption expenditures relative to their income in an attempt to maintain their consumption position with regards to the top despite falling relative incomes. Following Bertrand and Morse (2016) we estimate this association via an IV specification in which we instrument  $\text{Log}(\text{ConsumptionRich})$  with  $\text{Log}(\text{80thPercentileIncome})$ . An IV specification helps to address measurement error in consumption, concerns due to differences in the measurement of housing consumption between renters and owner-occupiers and possible bias due to unobserved confounders at the state-level that might simultaneously affect consumption expenditures of non-rich and rich households. We present both first- and second-stage results in Table A3 of the appendix. We estimate our model for the entire sample of non-rich households, as well as for our subsamples of non-rich renters and homeowners. The results are analogous to those in Table 2. We find that non-rich spending out of income is significantly and positively related to consumption of the rich, which is in turn driven by non-rich owner-occupiers.

In Table 3 we allow for heterogeneous effects along the four quintiles of the income distribution in our sample of non-rich households, by interacting our explanatory variable of interest with an indicator of quintile affiliation. Our estimates are closely aligned with our descriptive findings of the earlier documented differential saving rate developments along the income distribution. We find the most pronounced increase in spending out of income in response to higher incomes of the rich for owner-occupiers in the first quintile of the income distribution. A 1% increase in income of the rich is associated with a 0.36 percentage point increase in consumption out of income, holding own incomes constant (Column 4). The estimated interaction effects for the remaining quintiles imply a considerably weaker relationship, which is consistent with the attenuated expansion of (housing) consumption and reduction of saving rates by higher quintiles, relative to owner-occupiers in the bottom quintile. In Column 2 we find the same pattern of heterogeneity for renter households, yet the estimated effects are quantitatively smaller and statistically insignificant.

Our findings suggest that rising income inequality substantially contributed to the earlier documented consumption and saving trends. The positive association between rising incomes or consumption at the top of the distribution and non-rich homeowners' spending out of income is driven by higher expenditures of households in the lower three quintiles of our sample with most pronounced effects for the bottom quintile, which mimics our descriptive findings. We document the same patterns in consumption responses to rising incomes at the top for renter households. Yet, consistent with the much more favourable saving rate developments of renter households we do not find statistically significant positive effects on overall consumption relative to income.

## 4.2. Status Consumption

Our findings in the previous section establish a positive relationship between rising incomes and consumption at the top of the regional income distribution and consumption of non-rich owner-occupiers, yet they do not imply a causal mechanism. We next empirically test the validity of the proposed status competition mechanism, drawing on our quantitative measures of visibility and status relevance. Our analysis follows the identification strategy proposed by Bertrand and Morse (2016) and Charles et al. (2009), that relies on visibility measures to identify consumption expenditures induced by concerns about relative standing. Following the notions of conspicuous consumption (Veblen, 2009) and positional externalities (Frank, 2008), concerns about relative standing should matter more for some goods than for others, based on differences in their visibility and status relevance. Thus, we expect households to allocate larger shares of their resources to goods that rank higher on our visibility and status indices in response to relatively declining incomes. Changing consumption and saving patterns of non-rich households should systematically relate to our measures of visibility or status relevance when motivated by concerns about relative standing.

We divide household expenditures in the EVS into the earlier described 18 categories (Table A1). We then estimate spending responses of non-rich homeowners and renters to rising incomes or consumption of the rich individually for each of the 18 categories, based on the following model:

$$c_{ist}^k = \alpha + \beta \ln(\bar{y}_{st,p=0.80}) + \gamma X_{ist} + \delta I_{ist} + \ln\left(\frac{p_{st}}{P_t}\right) + \Theta_s + \mu_t + \tau \text{statetrend} + \varepsilon_{ist} \quad (2)$$

where  $c_{ist}^k$  is the income share allocated to a given category  $k$  by non-rich household  $i$  in state  $s$  and year  $t$ , calculated as expenditures on a given category over disposable household income.  $p_{st}$  is the state-specific CPI and  $P_t$  is the overall CPI. The remainder is analogous to the baseline model.<sup>12</sup> In addition to the income share of a given category, we estimate specifications in which the dependent variable is defined as the budget share of category consumption in overall consumption expenditures. We run regressions separately for renters and homeowners.

Results are reported in Table A4 of the appendix. Each of the reported coefficients stems from an individual regression. Both renters (Panel A) and homeowners (Panel B) allocate substantially larger income shares to housing in response to rising incomes at the top. However, for our subsample of homeowners we estimate a relationship that is more than three times as large as for renter households. Another category with large and signif-

<sup>12</sup>We estimate a variant of our model where we additionally control for the category-specific CPI of each category. Our results are largely unchanged. However, we lose a lot of observations for several of our category-estimations due to coverage issues for some CPI components.

icant positive income share responses for both homeowners and renters is holidays. Both housing and holidays rank at the top of the visibility and the status relevance indices. The categories vehicles and furniture rank comparably high. We find that homeowners increase their income shares allocated to vehicles in response to rising incomes at the top and estimate large positive spending responses on furniture for renters. We estimate a small negative, yet insignificant reduction of income shares allocated to food, alcohol and tobacco for all, as well as a significant reduction of health expenditures and spending on telephone & internet for all. Generally, we estimate larger positive consumption responses of homeowners, across most of our categories. Despite these large expansions of consumption relative to income of owner-occupiers we only see minor income share reductions for some other categories. Instead, we find that higher spending in response to rising incomes at the top translates into a substantial reduction of saving rates. We do not find such a relationship for renters, for whom positive consumption responses seem to be compensated by income share reductions on other categories.

In Figure 7 we plot the estimated coefficients for renters (Figure 7a) and homeowners (Figure 7b) from our income share specifications against the measures of visibility and status relevance for the respective categories. The associated correlations are reported in Table A5 of the appendix. The dashed line in Figure 7 indicates that within the 17 consumption categories (excluding saving), estimated consumption responses are systematically related to our measures of visibility and status relevance for both renters and homeowners. Non-rich households disproportionately increase their income shares allocated to more visible and status relevant consumption categories when facing higher consumption or income at the top of the income distribution. This result strongly indicates increased status-seeking in response to rising income inequality.

The solid lines in Figure 7 represents the correlation of our index values with all estimated spending responses, including saving. The association remains unchanged by the inclusion of the saving category for the sample of renters, as the estimated saving rate response is close to zero. A different picture emerges for our subsample of homeowners when we take into account the large saving rate reduction as incomes rise at the top. At first glance, it appears that the overall spending responses of non-rich homeowners are more strongly related to the visibility measure than to the measure of status relevance. However, the initially positive correlation with the status relevance index is solely dispersed due to the large negative saving rate response as an outlier. Saving is one of the most status relevant uses of disposable income. A reduction in saving rates for higher consumption expenditures can therefore only be status-increasing and thus expression of status orientation if it occurs in favour of the three categories with a higher status relevance than saving, namely housing, holidays, and vehicles, which are in fact the three categories for which we estimate the largest positive income share increases.

In Table 4 we divide total household consumption into a component comprising the

categories ranking above saving on the status relevance scale versus the rest and estimate spending responses to increasing top incomes. For renter households, we find no negative effect on savings and a relatively small, insignificant effect on consumption in the status relevant categories. Slightly higher saving rates and income shares allocated to the most status relevant categories are offset by a significant reduction in income shares of other less status relevant consumption categories.

In contrast to our sample of renters, we find a large negative saving rate response among non-rich owner-occupiers. This reduction is entirely due to an expansion of spending in the three categories that are more status relevant than saving, with housing expenditures accounting for about half of the total effect. Hence, the non-positive correlation of income share reallocations and our measure of status relevance in Figure 7b due to the large negative saving rate response of homeowners is not conflicting a status seeking explanation.

Overall, we find that both non-rich renters and homeowners allocate increasing income shares toward more visible and status relevant categories with rising income inequality, which we interpret as strong evidence of status-seeking behaviour of non-rich households. Particularly striving for social status through residential property appears to be central in explaining the large saving rate reductions of lower-income homeowners. Effects are much smaller for renters, for which differential price developments and overall demographic composition effects likely explain most of the expansion of housing income shares (Dustmann et al., 2022).

Our results indicate that neither renter nor homeowner households were willing to reduce their status relevant savings at the benefit of higher visible consumption. Instead, the large negative saving rate response of homeowners is entirely accounted for by higher income shares allocated to the most status relevant consumption categories and particularly housing. Hence, the willingness to reduce saving rates at the benefit of higher consumption expenditures primarily hinges on the status relevance of the respective categories and the competitive advantages from an improved relative standing.

### 4.3. Robustness Checks

We have shown that rising incomes and consumption at the top of the income distribution induce higher consumption expenditures and reduced saving rates of non-rich households and particularly non-rich owner-occupiers. Our findings are consistent with an explanation based on inequality-fuelled status consumption effects. However, in absence of a causal identification strategy we cannot rule out some unobserved confounder. Therefore, we conduct a series of empirical robustness tests in which we address the most likely competing explanations.<sup>13</sup> In testing some of these alternative explanations we rely on

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<sup>13</sup>Most of our tests for the alternative explanations of our baseline finding rely on empirical strategies as described by Bertrand and Morse (2016).



the SOEP for its panel component. In the SOEP households are not asked to provide information about their overall consumption expenditures. However, households report their housing expenditures.<sup>14</sup> We cross-check our finding with this additional dataset to confirm that they are not driven by some artefact unique to the EVS, by first replicating our baseline analysis for housing consumption.<sup>15</sup> Columns 1 and 2 in Table A7 of the appendix present the results from an analysis where we employ housing consumption as a share of household income as our dependent variable. In Columns 4 and 6 we conduct subsample analysis for homeowners and renters. Based on the SOEP we find housing income share responses of non-rich households to rising incomes at the top that are virtually identical to our EVS estimates.

### *A. Residential Mobility*

Next, we address the potential role of residential mobility in explaining our finding. Dustmann et al. (2022) provide evidence that costs associated with residential mobility contributed to rising income shares allocated to housing, particularly for low-income households. If residential mobility is positively correlated with rising incomes at the top of the distribution, then such a relationship might drive our results. Based on data from the SOEP, we investigate this mechanism by directly controlling for the effect of housing tenure on housing consumption relative to income.<sup>16</sup> The results in Columns 3, 5 and 7 of Table A7 show that the estimated coefficients for the overall sample, as well as the subsamples of renters and homeowners are unaffected by this additional control variable. This suggests that the coefficient on  $\text{Log}(80\text{thPercentileIncome})$  does not pick up any relationship between the frequency of residential moves and housing expenditures of the non-rich.

### *B. Home Equity and Mortgage Payments*

Rising top income levels in a given state might be positively correlated with house prices (Matlack and Vigdor, 2008). This could explain our baseline result if non-rich homeowners increase their consumption expenditures in response to housing wealth gains and greater home equity (Aladangady, 2017; Mian and Sufi, 2011; Mian et al., 2013). We draw on information in the EVS on households' real estate wealth and empirically assess this mechanism by directly controlling for  $\text{Log}(\text{HousingWealth})$  in a replication of our analysis

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<sup>14</sup>The SOEP only captures mortgage interest payments in combination with mortgage repayment. We follow Dustmann et al. (2022) by calculating the share of mortgage interest payments based on the EVS and applying these to obtain mortgage interest payments net of mortgage repayment in the SOEP.

<sup>15</sup>The analysis of housing consumption based on the SOEP in Table A7 is restricted to the years 2000 to 2014. We exclude data prior to 2000 since the variable on running costs of housing is not comparable to following years. Data from 2015 is excluded, as the rent expenditure variable is not comparable to earlier years.

<sup>16</sup>Housing tenure is defined as the number of years since the household moved into its current residence.

for the subsample of homeowners in Table 2. Results are reported in Columns (1) and (2) of Table A8. As theoretically predicted, the coefficient on  $\text{Log}(\text{HousingWealth})$  enters positively. However, the estimated coefficients on  $\text{Log}(\text{80thPercentileIncome})$  are virtually unchanged.

Similarly, falling mortgage interest rates during our period of observation (Figure 6) could enable non-rich homeowners to reduce their mortgage repayment rates, freeing up resources for consumption irrespective of status considerations. This could explain our findings if correlated with rising incomes at the top. Mortgage interest rates remained at relatively high levels from 1998 through 2008 and then started to decline considerably. Hence, the estimated relationship would have to be larger for the period post 2008. In Columns 3 and 4 of Table A8, we show that the coefficient on  $\text{Log}(\text{80thPercentileIncome})$  is in fact slightly larger for the years prior to 2008.

### *C. Local Prices*

Growing incomes at the top of the distribution might be positively correlated with local prices. Higher local prices in federal states with growing incomes and consumption of the rich could cause non-rich households to spend more without any actual behavioural changes, if they are slow to adjust their consumption to price changes, due to habit formation (Alessie and Lusardi, 1997), consumption commitments (Chetty and Szeidl, 2016) or inattention (Reis, 2006).

In Columns 1 to 4 of Table A9, we use state-level CPIs to estimate whether they correlate with our explanatory variables  $\text{Log}(\text{80thPercentileIncome})$  and  $\text{Log}(\text{90thPercentileIncome})$  in a state-year panel. In Columns 1 and 2 we draw on our measure of income of the rich as calculated in the SOEP, which allows for a much larger number of observations. The estimated coefficients on  $\text{Log}(\text{80thPercentileIncome})$  and  $\text{Log}(\text{90thPercentileIncome})$  suggest a negative relationship that is however not statistically significant at conventional levels. Columns 3 and 4 replicate this analysis based on distributional income measures as calculated in the EVS. We do not find any evidence that rising incomes at the top are positively correlated with local prices.

In Columns 5 to 10 of Table A9 we introduce state-level CPIs as an additional control in our baseline model. Our point estimates are unaffected, suggesting that the positive relationship between incomes or consumption at the top and non-rich homeowners' consumption expenditures does not hinge on local prices.

### *D. Permanent Income*

Non-rich households might anticipate higher future own incomes when observing growing incomes of the rich. This positive shock to their (perceived) permanent income could induce them to instantly spend more, thereby smoothing their consumption intertemporally.

The documented saving rate reduction and higher consumption expenditures of non-rich owner-occupiers might be the result of improved income prospects, if this is particularly true for those households that decide to become homeowners. Hence, we ask whether these households spend more and dissave when incomes at the top of the distribution rise because of improved income prospects. In Table A10 we rely on panel data from the SOEP to assess such a relationship by estimating whether higher incomes at the top of the regional income distribution predict higher future incomes of non-rich owner-occupiers.

We estimate the relationship between future income of a given homeowner household below the 80th percentile of the state-year income distribution and our explanatory variables  $\text{Log}(80\text{thPercentileIncome})$  or  $\text{Log}(90\text{thPercentileIncome})$ , while employing the same set of control variables as before. We look at non-rich households' income in one, two or four years (Columns 1 to 6) or averaged over the coming two and four years (Columns 7 to 10) as our dependent variables. We do not find a positive effect of incomes of the rich (Panel A) or very rich (Panel B) on future incomes of non-rich owner-occupiers in any of our specifications. Instead, some of our point estimates imply a negative relationship.<sup>17</sup>

In Table A11 we provide additional evidence on this channel, by testing whether incomes of the rich are positively related to non-rich homeowners' sentiment about their own financial situation or the overall economic development. We conduct this analysis with SOEP data at the individual level, meaning that our sample consists of all individuals living in owner-occupier households. Neither  $\text{Log}(80\text{thPercentileIncome})$ , nor  $\text{Log}(90\text{thPercentileIncome})$  are significantly related to non-rich homeowners' expectations towards their own financial situation (Columns 1 to 4) or the overall economy (Columns 5 to 8). This finding is consistent with our previous results in Table A10. Both oppose the notion of a positive relationship between income developments at the top and future household income (expectations) of the non-rich.

### *E. Precautionary Savings*

We investigate whether our initial finding could be explained by a precautionary savings motive, by asking if rising incomes at the top are related to higher stability of non-rich homeowner households' future incomes. Reduced future income uncertainty could attenuate the need for precautionary savings and induce higher current consumption (Carroll, 1994). In Columns 11 and 12 of Table A10 we provide estimates with SOEP data in which we do not find a negative relationship between  $\text{Log}(80\text{thPercentileIncome})$  or  $\text{Log}(90\text{thPercentileIncome})$  and future income uncertainty of non-rich owner-occupiers, measured as the standard deviation of the logarithm of non-rich households' income between  $t+1$  and  $t+4$ .

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<sup>17</sup>We obtain comparable results for the sample of renters (available on request).

## 4.4. Economic Magnitude

Supposing that our estimated relationship does indeed represent a causal mechanism, we assess the economic magnitude of the effect of rising income inequality on non-rich households' saving rates by conducting back-of-the-envelope counterfactual calculations. We estimate how much higher the saving rates of non-rich households would have been, had incomes at the top grown at the same rate as those of the non-rich throughout our period of observation.

We start by calculating the median income growth rate by year for each quintile of non-rich households. We then estimate the difference in non-rich households' saving rates by quintile by applying these growth rates to our explanatory variable  $\text{Log}(80\text{thPercentileIncome})$  respectively. We conduct this analysis separately for renters and homeowners. Coefficients for quintile-specific saving rate responses to  $\text{Log}(80\text{thPercentileIncome})$  come from an estimation analogous to Columns (2) and (4) of Table 3.

Results are presented in Table A12 of the appendix. We only show results for homeowner households, as non-rich renters' consumption out of income and saving rates are not significantly affected by rising incomes at the top and the estimated counterfactual saving rates are indiscernible from their reported saving rates. The implied marginal effects of  $\text{Log}(80\text{thPercentileIncome})$  on quintile saving rates are reported at the top of Table A12. The actual, reported saving rates of non-rich homeowner households by quintile in our EVS sample are shown for each year in Panel A. Panel B reports by how much higher these saving rates would have been, had incomes at the top grown at the same rate as for the median household of the respective quintile. The resulting counterfactual saving rates are presented in Panel C. In Figure 8 we plot household saving rates by quintile of the income distribution as in Figure 3b yet include counterfactual saving rates for the four quintiles of non-rich homeowners. For 2008, which is the first year in our sample with substantially increased income inequality, we estimate that the saving rates of homeowners in the first quintile would have been 3.4 percentage points higher under the counterfactual assumption. By 2013 (2018), the difference between reported and counterfactual saving rates accumulates to 5.4 (5.5) percentage points. For 2018, we calculate a counterfactual saving rate of -2.4% for non-rich homeowners in the lowest quintile, opposed to a reported saving rate of -7.9%. While saving rate developments at the bottom of the income distribution are not key to aggregate trends, it becomes evident from Figure 8 that status consumption substantially contributed to the documented decline of saving rates among lower-income households and the spread in saving rates along the income distribution.

## 5. Discussion and Conclusion

Our goal in this paper was to understand whether rising income inequality in Germany contributed to falling saving rates in lower quintiles of the income distribution. Contrary

to prior belief, we show that the decline of saving rates among non-rich households was mostly driven by low-income homeowners, who most notably increased their housing expenditures relative to disposable incomes. The overall increase in household consumption relative to income in the bottom half of the income distribution coincides with sharp increases in income inequality. Our results suggest that much of the decline in saving rates and the consumption expansion of lower- and middle-income households is attributable to status seeking behaviour. With falling relative incomes, they directed larger shares of their disposable incomes toward status relevant and visible uses. Especially low-income homeowners took on increasing financial burdens to participate in the highly status relevant market for owner-occupied housing. This contributed to the spread of saving rates along the income distribution. Markedly higher saving rates among low-income renter households relative to owner-occupiers show that these have fared much better than previously suggested by Dustmann et al. (2022), particularly against the backdrop of research that highlights the role saving rate inequality for wealth distribution (Saez and Zucman, 2016).

Generally, housing appears to be key to social status and central in understanding these trends. We identify housing consumption as highly visible and status relevant. Housing is associated with important positional consumption effects. Higher current relative spending can allow households to move to desired neighbourhoods, thereby gaining access to beneficial social networks and public infrastructure, such as schools or childcare. These might in turn positively affect own economic outcomes and future income prospects and hence boost social status dynamically. This investment purpose makes housing key to expenditure-driven status competition. Other similarly functioning categories such as education or health are largely decommodified in Germany, as access is guaranteed through the public provisioning system.

Our findings regarding housing consumption and particularly residential property uncover close similarities with results from the U.S., where it is argued that rising income inequality and a status-driven consumption expansion with a strong focus on homeownership played a central role in explaining the reduction of household saving rates in the build-up of the financial crisis (Bertrand and Morse, 2016; Rajan, 2010). Yet, the magnitude of our estimates is smaller than what comparable studies suggest for U.S. households (Bertrand and Morse, 2016). Status competition in Germany has so far not been associated with a widespread reduction in saving rates as was the case for the U.S. For one, our results indicate that this might be due to the more limited increase in income inequality. Absent U.S.-style increases of top household income shares, rising income inequality mostly implied relative income losses for those in the lower half of the income distribution. Whereas an explosion of top income shares in the U.S. seems to have triggered expenditure cascades starting right below the top (Frank et al., 2014), where saving rates declined most dramatically (Saez and Zucman, 2016). Moreover, our survey results show

that individuals in Germany perceive saving as highly status relevant, which likely leaves most of them unwilling to reduce their saving rates in order to maintain higher relative consumption expenditures. Thereby, our findings add to the literature that documents comparatively high saving rates of Germany's middle class (Albers et al., 2022) and provide a rationale to why rising personal income inequality in Germany had a much more limited effect on the current account balance compared to the U.S. (Behringer and van Treeck, 2018).

On the other hand, we show that housing consumption responses are most pronounced for lower-income owner-occupiers, while renters reacted to a much smaller degree. This contrasts strongly with results by Bertrand and Morse (2016), who explicitly show that both U.S. homeowners and renters increased their housing expenditures on a similar scale, as top incomes grew relative to the rest. We suspect that the comparatively strict regulation of the German rental market insulated non-rich renters from status pressures and prevented an even larger expansion of housing consumption and saving rate reductions. As pointed out by Dustmann et al. (2022), the rise in income shares allocated to housing by low-income renters in Germany, as well as overall levels, remain markedly below those in the U.S., where low-income renters spend about half of their incomes on rent (Larrimore and Schuetz, 2017).

Lastly, the large effects for owner-occupiers point towards an important role of the housing market. Spending on residential property is associated with real estate asset holdings. Thus, if households expect rising house prices relative to the prices of other assets, they could perceive expected capital gains in housing wealth as a substitute for savings. This would enable them to incur higher income shares on housing expenditures and reduce their saving rates while having higher visible and status relevant income allocations. Yet, betting on rising house prices exposes them to increased financial risks in case of housing market downturns, which particularly applies to households at the lower end of the income distribution.

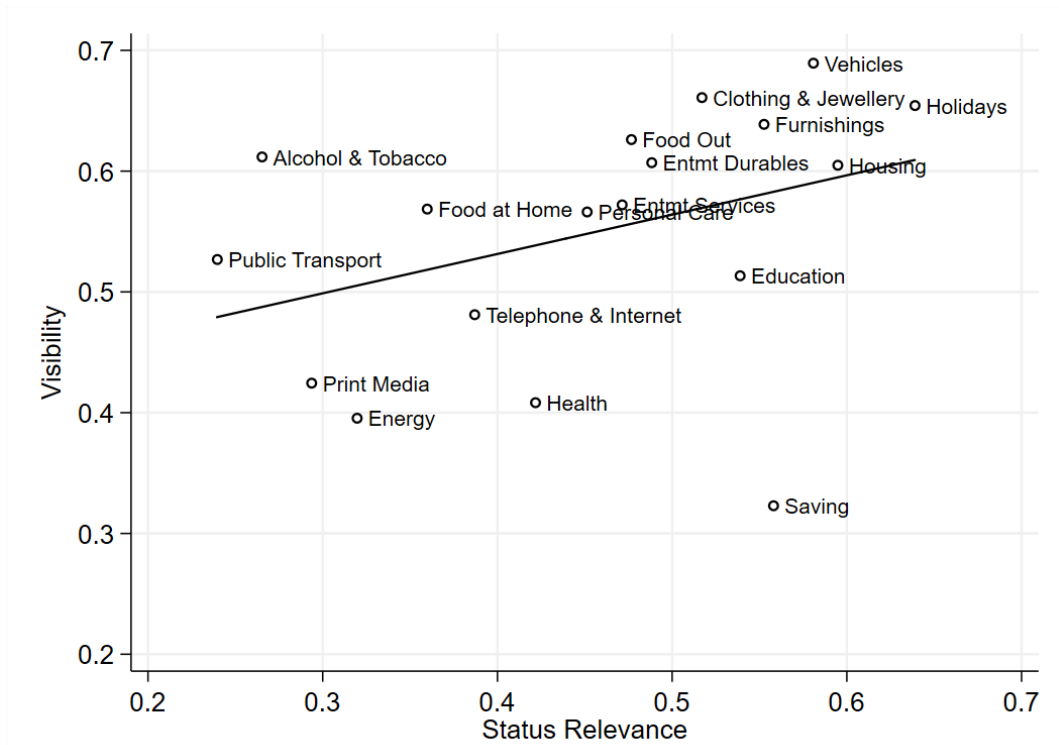
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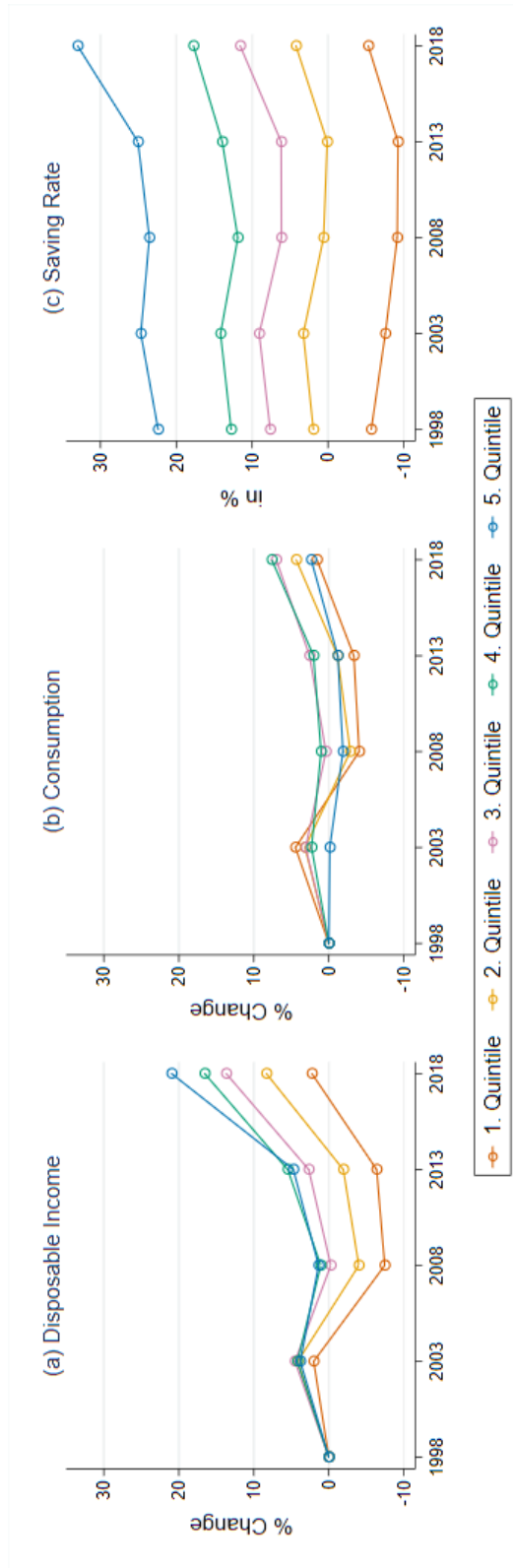


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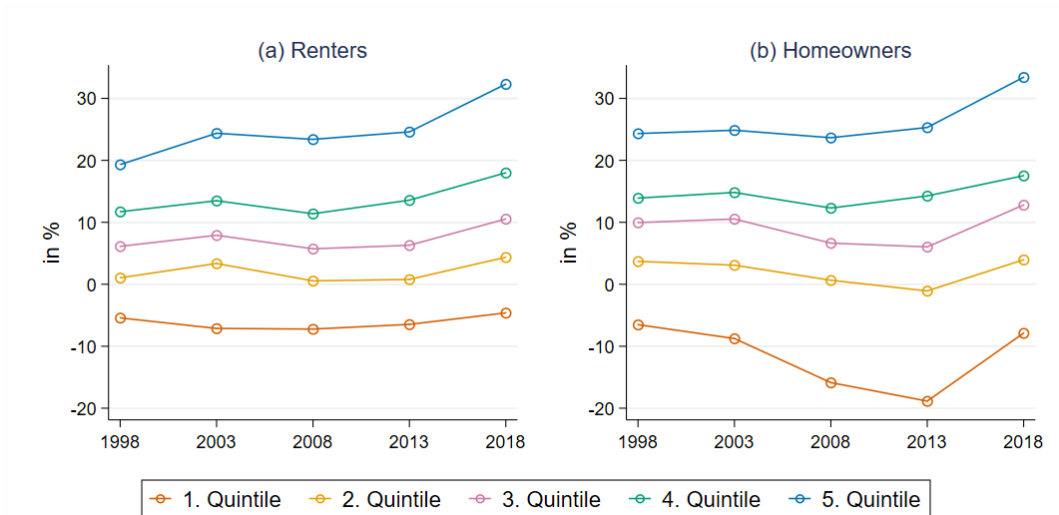
*Notes:* The y-axis plots our visibility measure and the x-axis plots our measure of status relevance. Exact values are given in Table 1. The solid line is a linear fit for the two measures. Data: Own survey - See Appendix B for a detailed description.

Figure 1: Plot of Visibility and Status Relevance



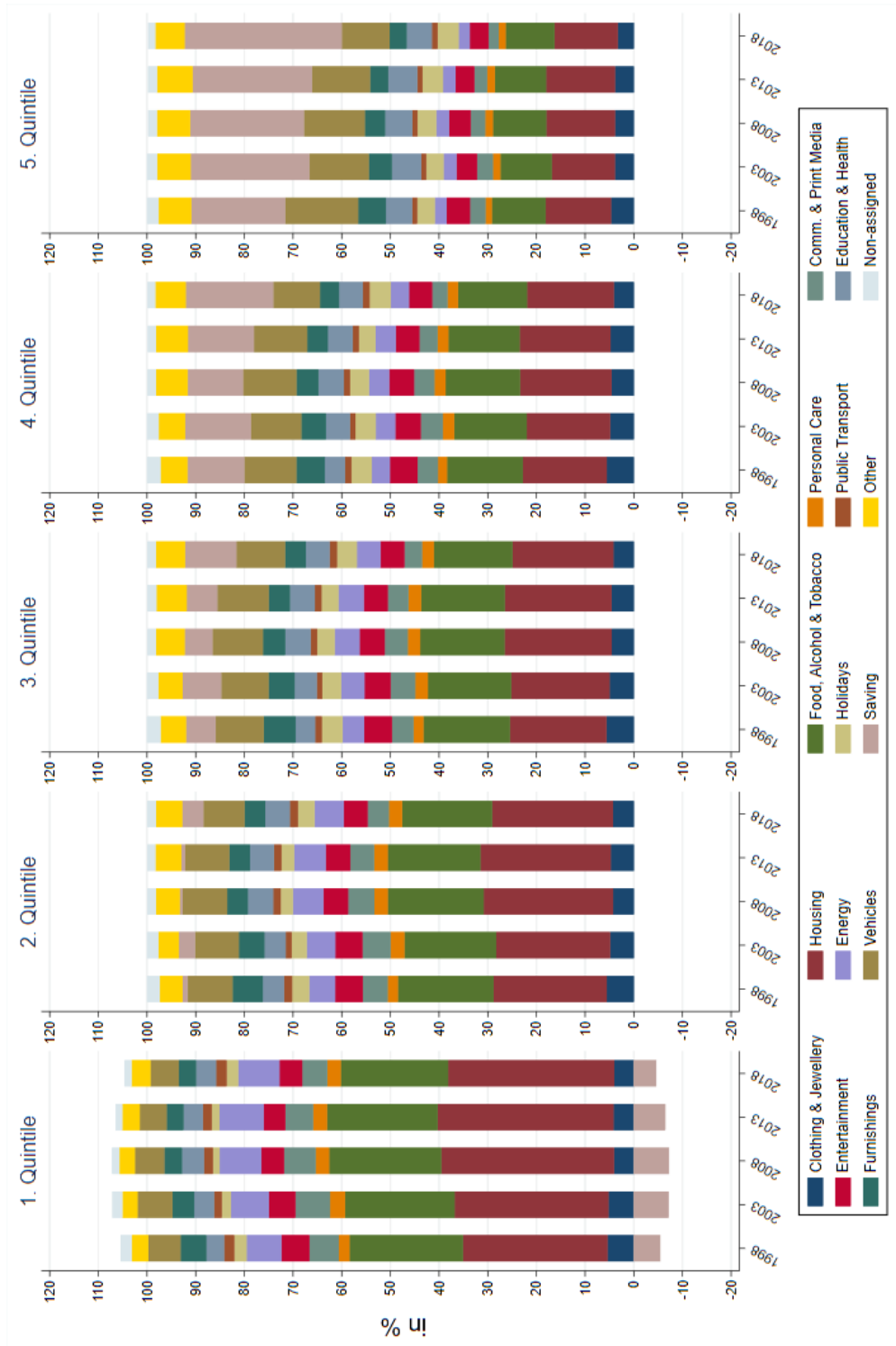
Notes: All values are equalised using the modified OECD equivalence scale. All values are deflated by the CPI to 2015 prices. Data: EVS, 1998 to 2018, author calculations.

Figure 2: Disposable Income, Consumption and Saving Rates by Quintile



*Notes:* All values are equivalised using the modified OECD equivalence scale. All values are deflated by the CPI to 2015 prices. Data: EVS, 1998 to 2018, author calculations.

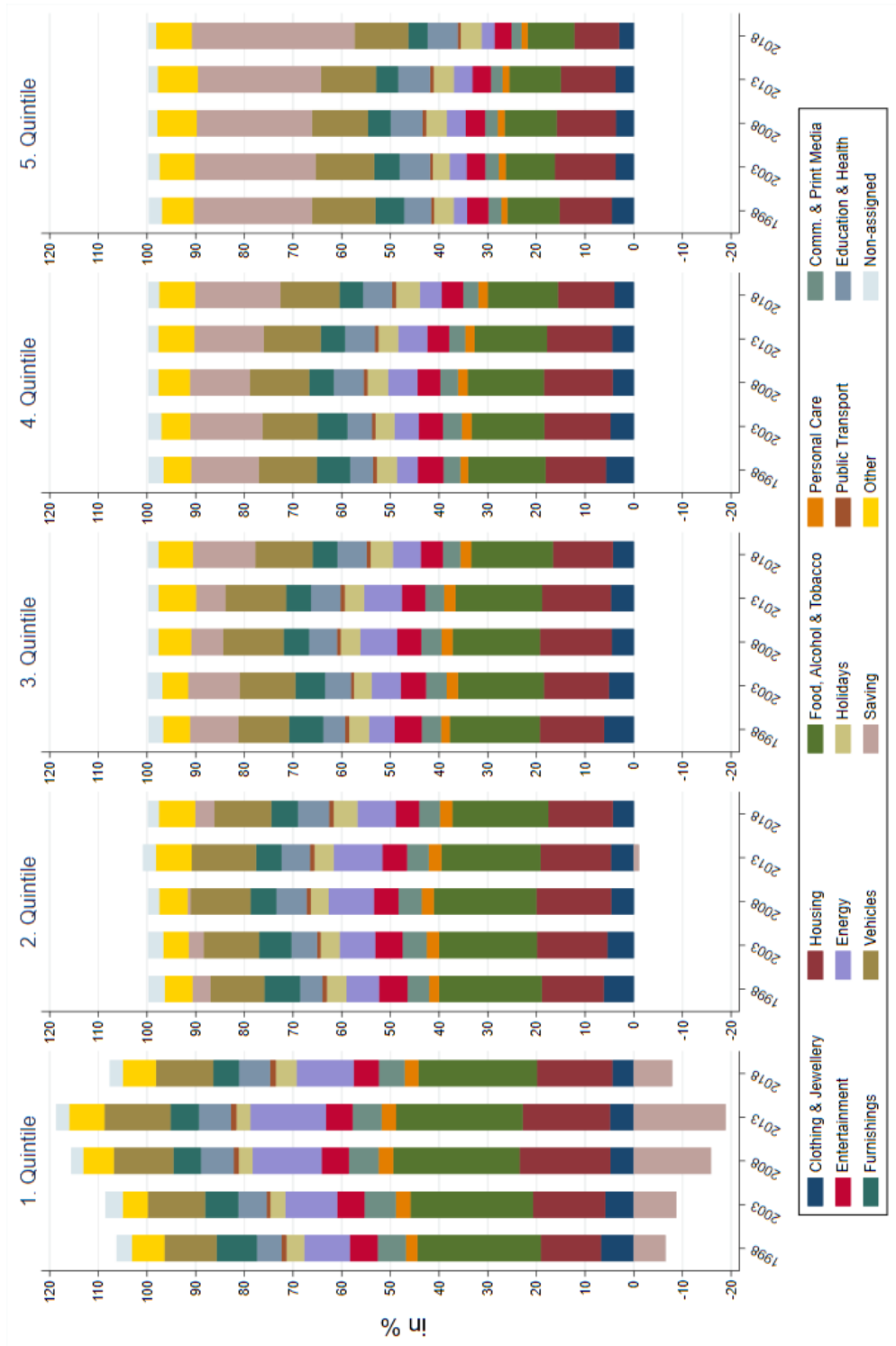
Figure 3: Saving Rates by Quintile for Homeowners and Renters



(a) Income Allocations of Renters

Notes: All values are equalised using the modified OECD equivalence scale. All values are deflated by the CPI to 2015 prices. Data: EVS, 1998 to 2018, author calculations.

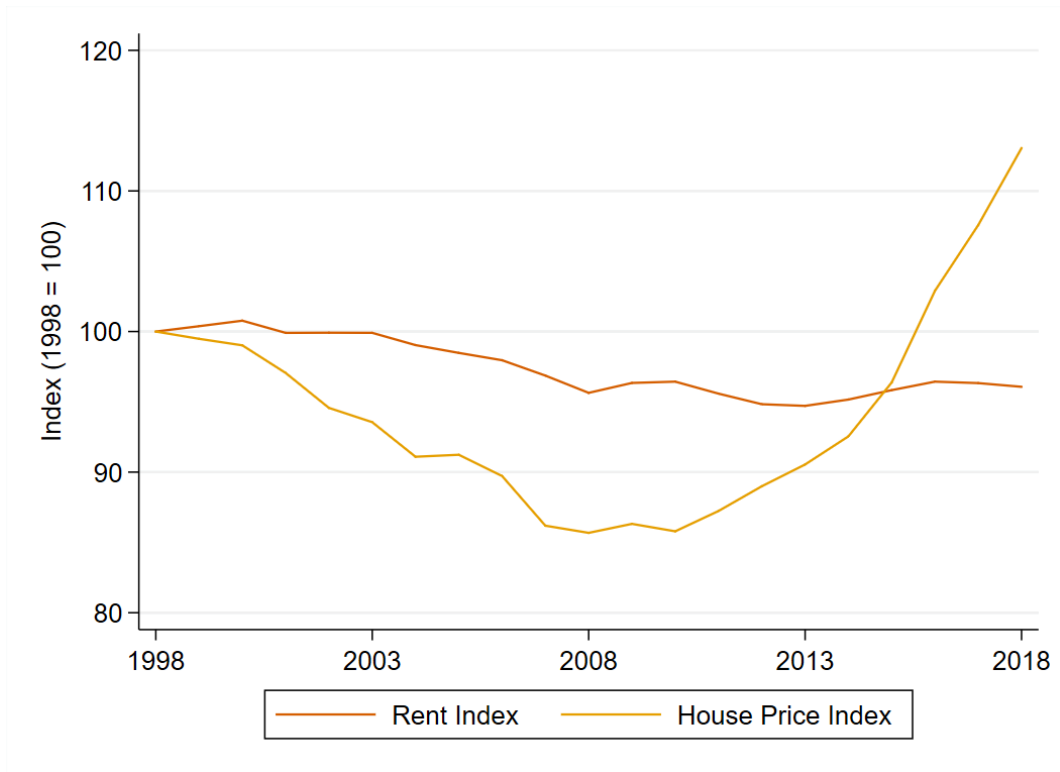
Figure 4: Income Allocations



(b) Income Allocations of Owners

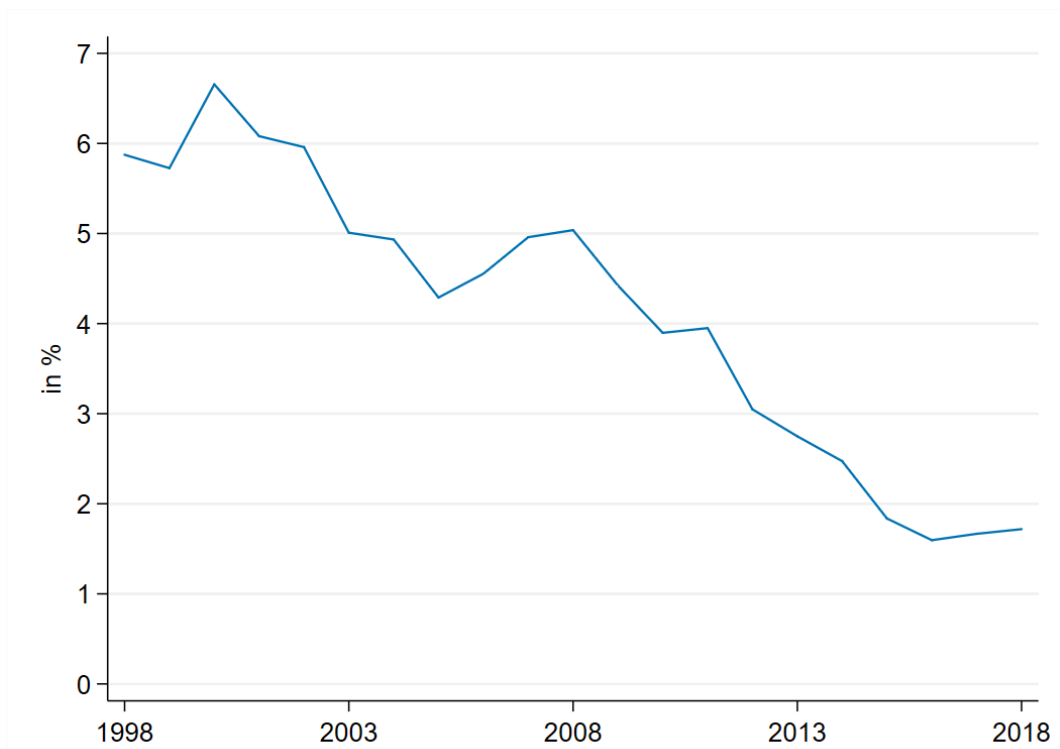
Notes: All values are equalised using the modified OECD equivalence scale. All values are deflated by the CPI to 2015 prices. Data: EVS, 1998 to 2018, author calculations.

Figure 4: Income Allocations



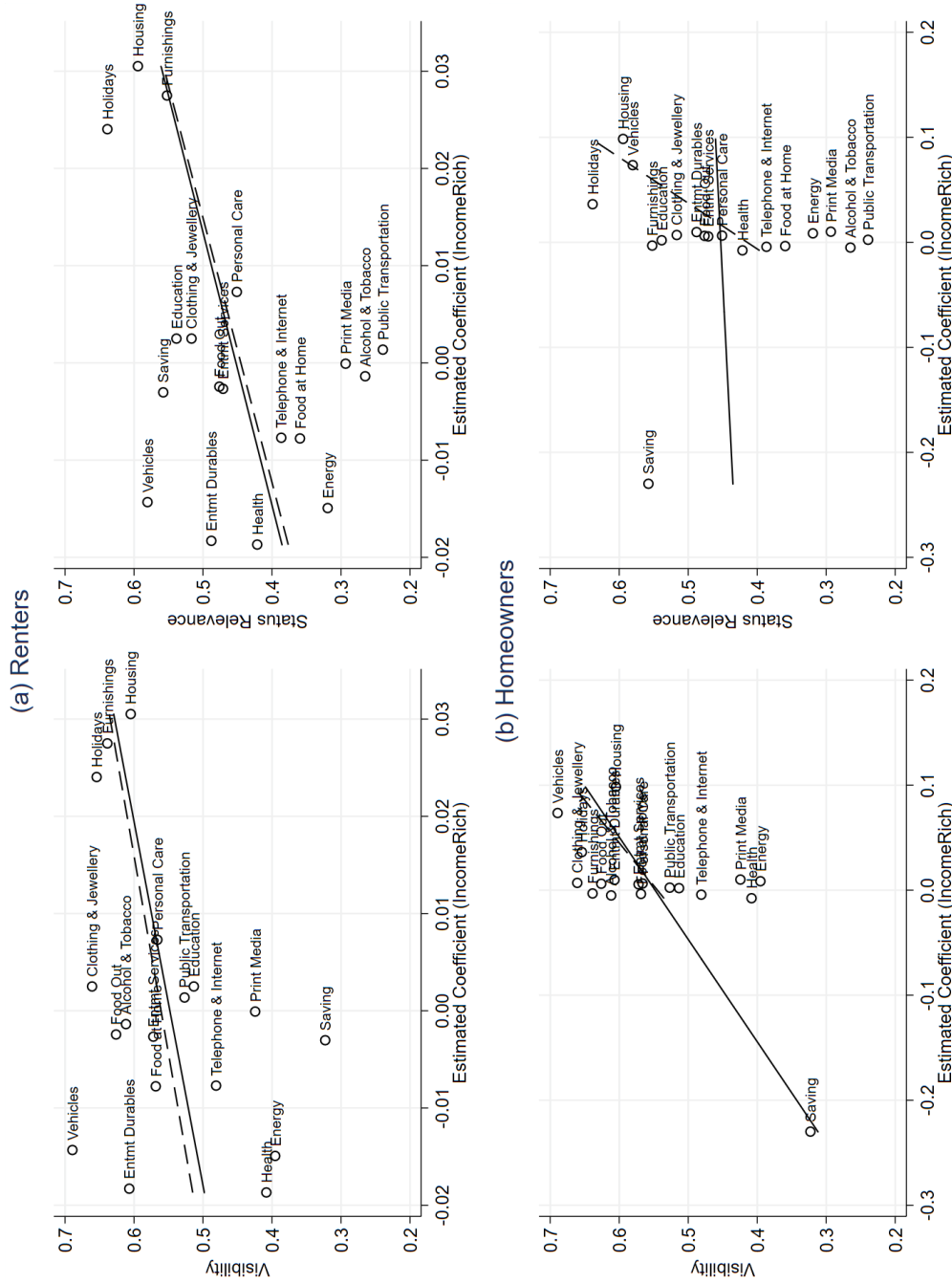
Notes: Data: OECD Analytical house price indicators.

Figure 5: Real Rent Index and Real House Price Index (1998=100)



Notes: Effective mortgage interest rates fixed at 10 years (1998 to 2002) and from over 5 to 10 years (2003 to 2018). Data: Bundesbank Zinsstatistik.

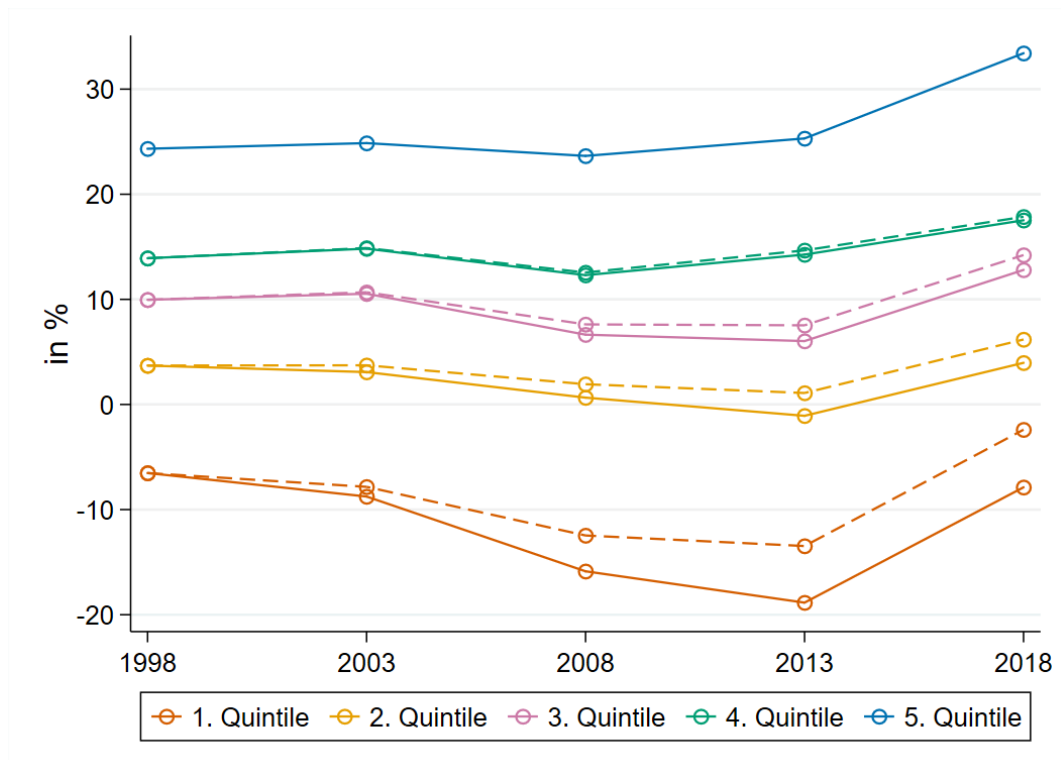
Figure 6: Mortgage Interest Rate



Notes: The y-axis plots our visibility measure (left side) or our measure of status relevance (right side). The x-axis plots the estimated coefficients from the regressions of household category consumption over disposable income on  $\text{Log}(80\text{thPercentileIncome})$ , as shown in Table A4. The solid lines are the linear fit across all 18 categories. The dashed lines are the linear fit when excluding the saving category.

Figure 7: Visibility and Status Relevance against Estimated Coefficient by Consumption Category





*Notes:* Solid lines show the same reported saving rates by quintile of the household income distribution as in Figure 3b. Dashed lines are the household saving rates under the counterfactual assumption described in Section 4.4. Data: EVS, 1998 to 2018, author calculations.

Figure 8: Counterfactual Saving Rates of Homeowners

Table 1: Visibility and Status Relevance Indices

	(1) Category	(2) Visibility	(3) Status Relevance
1	Clothing & Jewellery	0.66	0.52
2	Housing	0.61	0.59
3	Food at Home	0.57	0.36
4	Food Out	0.63	0.48
5	Alcohol & Tobacco	0.61	0.27
6	Personal Care	0.57	0.45
7	Telephone & Internet	0.48	0.39
8	Print Media	0.42	0.29
9	Entertainment Services	0.57	0.47
10	Energy	0.40	0.32
11	Holidays	0.65	0.64
12	Public Transportation	0.53	0.24
13	Education	0.51	0.54
14	Health	0.41	0.42
15	Furnishings	0.64	0.55
16	Entertainment Durables	0.61	0.49
17	Vehicles	0.69	0.58
18	Saving	0.32	0.56

*Notes:* The table shows the values for our visibility and status relevance indices by expenditure category. The measures are constructed from responses to our own survey. The methodology is described in Section 2.2. Data: Own survey - See Appendix B for a detailed description.

Table 2: Income of the Rich and Non-Rich Consumption

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Total Consumption/Income							
Sample:	x < 80th		x < 80th, Renters		x < 80th, Owners			
Log(80thPercentileIncome)	0.111*** (0.033)		0.091*** (0.027)	0.104*** (0.022)	0.015 (0.027)	0.020 (0.028)	0.267*** (0.079)	0.282*** (0.072)
Log(90thPercentileIncome)		0.121** (0.040)						
Unemployment Rate				-0.427** (0.183)		-0.181 (0.222)		-0.617 (0.400)
State and year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State-specific time trends	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Household income FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	155574	155574	155574	155574	88941	88941	66633	66633
R <sup>2</sup>	0.117	0.117	0.117	0.117	0.135	0.135	0.100	0.100

Notes: The sample consists of household-year observations below the 80th percentile in the state-year income distribution. In Columns 5 and 6, the sample is restricted to renter households and in Columns 7 and 8 the sample consists of homeowners. The dependent variable is defined as total household consumption over income for a given EVS household in a given state and year. Data: EVS, 1998 to 2018.

Table 3: Quintile Heterogeneity

	(1)	(2)	(3)	(4)
	Total Consumption/Income			
Sample:	x<80th, Renters			
Log(80thPercentileIncome)	0.028 (0.029)	0.041 (0.035)	0.247*** (0.076)	0.355** (0.120)
Q=2 × Log(80thPercentileIncome)		0.008 (0.018)		-0.086 (0.075)
Q=3 × Log(80thPercentileIncome)		-0.026 (0.030)		-0.126 (0.086)
Q=4 × Log(80thPercentileIncome)		-0.068 (0.047)		-0.163* (0.076)
Unemployment Rate	-0.178 (0.217)	-0.183 (0.220)	-0.612 (0.396)	-0.628 (0.398)
State and year FEs	Yes	Yes	Yes	Yes
State-specific time trends	Yes	Yes	Yes	Yes
Household income FEs	Yes	Yes	Yes	Yes
Household controls	Yes	Yes	Yes	Yes
Quintile Indicator	Yes	Yes	Yes	Yes
Observations	88941	88941	66633	66633
$R^2$	0.135	0.135	0.100	0.100

*Notes:* The sample consists of household-year observations below the 80th percentile in the state-year income distribution. In Columns 1 and 2, the sample is restricted to renter households and in Columns 3 and 4 the sample consists of homeowners. The dependent variable is defined as total household consumption over income for a given EVS household in a given state and year. Q indicates the respective quintile of the state-year income distribution. Data: EVS, 1998 to 2018.

Table 4: Income of the Rich and Non-Rich Status Consumption

	(1)	(2)	(3)	(4)	(5)	(6)
	Status	Other	Saving	Status	Other	Saving
Sample:	x<80th, Renters			x<80th, Owners		
Log(80thPercentileIncome)	0.039 (0.028)	-0.037*** (0.011)	-0.002 (0.031)	0.219*** (0.056)	0.022 (0.029)	-0.241*** (0.063)
Unemployment Rate	0.187 (0.266)	-0.382*** (0.109)	0.195 (0.214)	-0.629** (0.260)	0.138 (0.207)	0.490 (0.421)
State and year FEs	Yes	Yes	Yes	Yes	Yes	Yes
State-specific time trends	Yes	Yes	Yes	Yes	Yes	Yes
Household income FEs	Yes	Yes	Yes	Yes	Yes	Yes
Household controls	Yes	Yes	Yes	Yes	Yes	Yes
Quintile Indicator	Yes	Yes	Yes	Yes	Yes	Yes
Observations	88941	88941	88941	66633	66633	66633
$R^2$	0.062	0.082	0.109	0.021	0.170	0.092

*Notes:* The sample consists of household-year observations below the 80th percentile in the state-year income distribution. In Columns 1 to 3, the sample is restricted to renter households and in Columns 4 to 6 the sample consists of homeowners. The dependent variable is defined as total status consumption (Columns 1 and 4), total other (non-status) consumption (Columns 2 and 5) or savings (Columns 3 and 6) over income for a given EVS household in a given state and year. Data: EVS, 1998 to 2018.

## Appendix A: Additional Results

Table A1: Expenditure Categories

	(1) Category	(2) Components
1	Clothing & Jewellery	clothing, shoes, jewellery, and watches
2	Housing	rent, maintenance & home repairs, operating costs, and mortgage interest payments
3	Food at Home	food and non-alcoholic beverages
4	Food Out	food and drinks at restaurants, cafés, canteens, etc.
5	Alcohol & Tobacco	alcoholic beverages and tobacco products
6	Personal Care	hairstressers and other personal care services appliances and consumables for personal care
7	Telephone & Internet	phone & internet services phone purchases
8	Print Media	books & brochures, newspapers, magazines, and stationary supplies
9	Entertainment Services	entry fees for sports and recreational events, cultural events, and institutions, etc broad-casting services and PayTV pets and veterinarians
10	Energy	home utilities such as electricity, gas, distance heating, warm water, etc.
11	Holidays	airline fares and lodging away from home
12	Public Transportation	public transportation like busses and trains
13	Education	education, from nursery to college, like tuition and other school expenses
14	Health	medical care, medical appliances, drugs, dentists, doctors, hospitals, attendance of people in need of care, etc.
15	Furnishings	home furnishings and household items, like furniture, appliances, tools, linen home ser-vices
16	Entertainment Durables	electric devices such as computers and TVs, bikes, musical and sports equipment, etc.
17	Vehicles	the purchase of new and used motor vehicles such as cars and motorbikes, vehicle insurance & repairs, fuels
18	Saving	

*Notes:* The table shows detailed components from which we construct our final expenditure categories.

Table A2: Income of the Rich and Non-Rich Consumption

	(1)	(2)	(3)	(4)
	Total Consumption/Income			
Sample:	x<80th			
Log(80thPercentileIncome)	0.111*** (0.033)		0.091*** (0.027)	0.104*** (0.022)
Log(90thPercentileIncome)		0.121** (0.040)		
Unemployment Rate				-0.427** (0.183)
Male	-0.026*** (0.003)	-0.026*** (0.003)	-0.026*** (0.003)	-0.026*** (0.003)
Marital Status (Base = Single)				
Married	0.038*** (0.004)	0.038*** (0.004)	0.039*** (0.004)	0.038*** (0.004)
Divorced / Widowed	0.013*** (0.003)	0.013*** (0.003)	0.013*** (0.003)	0.013*** (0.003)
German	0.027*** (0.008)	0.027*** (0.008)	0.027*** (0.008)	0.027*** (0.008)
Number of Children (Base = 0)				
1	0.038*** (0.001)	0.038*** (0.001)	0.038*** (0.001)	0.038*** (0.001)
2	0.052*** (0.002)	0.052*** (0.002)	0.052*** (0.002)	0.052*** (0.002)
3	0.089*** (0.007)	0.089*** (0.007)	0.090*** (0.007)	0.090*** (0.007)
4	0.104*** (0.019)	0.104*** (0.019)	0.104*** (0.019)	0.104*** (0.019)
5	0.090*** (0.027)	0.090*** (0.027)	0.090*** (0.027)	0.090*** (0.027)
6 or more	0.167** (0.071)	0.166** (0.071)	0.166** (0.071)	0.166** (0.071)
Number of Adults (Base = 1)				
2	0.115*** (0.005)	0.115*** (0.005)	0.115*** (0.005)	0.115*** (0.005)
3	0.147*** (0.010)	0.147*** (0.010)	0.148*** (0.010)	0.148*** (0.010)
4	0.191*** (0.017)	0.191*** (0.017)	0.191*** (0.017)	0.191*** (0.017)
5 or more	0.210*** (0.056)	0.210*** (0.056)	0.211*** (0.056)	0.211*** (0.056)

Table A2: Continued

	(1)	(2)	(3)	(4)
	Total Consumption/Income			
Sample:	x<80th			
Professional Training (Base = None)				
Apprenticeship	0.035*** (0.006)	0.035*** (0.006)	0.035*** (0.006)	0.035*** (0.006)
Technical School	0.059*** (0.005)	0.059*** (0.005)	0.059*** (0.005)	0.059*** (0.005)
College	0.087*** (0.006)	0.087*** (0.006)	0.087*** (0.006)	0.087*** (0.006)
Homeowner Status (Base = Renter)				
Owner with Mortgage	-0.011*** (0.003)	-0.011*** (0.003)	-0.011*** (0.003)	-0.011*** (0.003)
Owner Outright	-0.003 (0.004)	-0.003 (0.004)	-0.003 (0.004)	-0.003 (0.004)
Region Type (Base = Rural)				
Urbanised	0.009* (0.005)	0.009* (0.005)	0.011*** (0.004)	0.011*** (0.004)
Agglomeration Area	0.033*** (0.009)	0.033*** (0.009)	0.036*** (0.008)	0.036*** (0.008)
State and year FEs	Yes	Yes	Yes	Yes
State-specific time trends	No	No	Yes	Yes
Household income FEs	Yes	Yes	Yes	Yes
Household controls	Yes	Yes	Yes	Yes
Observations	155574	155574	155574	155574
$R^2$	0.117	0.117	0.117	0.117

*Notes:* The table shows regression results that are identical to Table 2, yet additionally presents estimated coefficients for the set of sociodemographic control variables, which were not shown in Table 2 due to space limitations. Data: EVS, 1998 to 2018.



Table A3: Rich Consumption and Non-Rich Consumption

	(1)	(2)	(3)	(4)
	First Stage	Second Stage IV		
	Log (Consumption Rich)	Total Consumption/Income		
Sample:	x<80th	x<80th, Renters	x<80th, Owners	
Log(80thPercentileIncome)	0.537*** (0.117)			
IV Log(ConsumptionRich)		0.194*** (0.042)	0.041 (0.058)	0.456*** (0.079)
Unemployment Rate	-0.174 (0.361)	-0.393*** (0.150)	-0.174 (0.201)	-0.535 (0.448)
State and year FEs	Yes	Yes	Yes	Yes
State-specific time trends	Yes	Yes	Yes	Yes
Household income FEs	Yes	Yes	Yes	Yes
Household controls	Yes	Yes	Yes	Yes
Observations	155574	155574	88941	66633
$R^2$	0.977	0.117	0.135	0.099

*Notes:* The sample consists of household-year observations below the 80th percentile in the state-year income distribution. In Column 3, the sample is restricted to renter households and in Column 4 the sample consists of homeowners. The dependent variable in Column 1 is the logarithm of the average consumption of rich households. The dependent variable in Columns 2 to 4 is defined as total household consumption over income for a given EVS household in a given state and year. IV Log(ConsumptionRich) is the instrumented logarithm of average consumption of rich households. Column 1 reports first-stage results for Columns 2 to 4, where we instrument Log(ConsumptionRich) with Log(80thPercentileIncome). Data: EVS, 1998 to 2018.

Table A4: Income of the Rich and Non-Rich Expenditures by Category

<b>Panel A: Renters</b>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Clothing & Jewellery		Housing	Food at Home	Food Out	Alcohol & Tobacco	Personal Care	Telephone & Internet	Print Media	Entmt. Services
Dependent Variable: Household Category Consumption/Disposable Income									
Log(80thPercentileIncome)	0.002 (0.006)	0.030* (0.015)	-0.008 (0.006)	-0.002 (0.004)	-0.001 (0.002)	0.007 (0.004)	-0.008** (0.003)	-0.000 (0.002)	-0.003 (0.006)
Dependent Variable: Household Category Consumption/Total Consumption									
Log(80thPercentileIncome)	0.004 (0.008)	0.032** (0.014)	-0.015* (0.009)	-0.001 (0.004)	-0.002 (0.003)	0.007 (0.004)	-0.009*** (0.003)	0.000 (0.002)	-0.003 (0.007)
(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	
Energy	Holidays	Public Transport	Education	Health	Furnishings	Entmt. Durables	Vehicles	Saving	
Dependent Variable: Household Category Consumption/Disposable Income									
Log(80thPercentileIncome)	-0.015** (0.005)	0.024*** (0.006)	0.001 (0.002)	0.002 (0.004)	-0.019*** (0.005)	0.027** (0.009)	-0.018** (0.007)	-0.014 (0.017)	-0.003 (0.033)
Dependent Variable: Household Category Consumption/Total Consumption									
Log(80thPercentileIncome)	-0.018** (0.006)	0.022*** (0.006)	0.005 (0.004)	0.000 (0.004)	-0.023*** (0.006)	0.019* (0.009)	-0.016** (0.006)	-0.016 (0.012)	

*Notes:* Each cell contains the result from a separate regression. The sample in Panel A consists of household-year observations of renters below the 80th percentile in the state-year income distribution. The sample in Panel B consists of household-year observations of homeowners below the 80th percentile in the state-year income distribution. The dependent variable is either defined as category-specific consumption over income or over total consumption for a given EVS household in a given state and year. We control for household characteristics, state and year fixed effects, state-specific time trends, unemployment rates and prices in all regressions. Data: EVS, 1998 to 2018.

Table A4: Income of the Rich and Non-Rich Expenditures by Category

<b>Panel B: Owners</b>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Clothing & Jewellery	Housing	Food at Home	Food Out	Alcohol & Tobacco	Personal Care	Telephone & Internet	Print Media	Entmt. Services
Dependent Variable: Household Category Consumption/Disposable Income									
Log(80thPercentileIncome)	0.007 (0.008)	0.098*** (0.023)	-0.004 (0.010)	0.006 (0.008)	-0.005 (0.008)	0.006 (0.004)	-0.004 (0.004)	0.010*** (0.003)	0.005 (0.005)
Dependent Variable: Household Category Consumption/Total Consumption									
Log(80thPercentileIncome)	-0.007 (0.007)	0.062*** (0.016)	-0.005 (0.016)	-0.010* (0.005)	-0.005 (0.006)	0.001 (0.003)	-0.013** (0.004)	0.003* (0.002)	-0.003 (0.007)
	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
	Energy	Holidays	Public Transport	Education	Health	Furnishings	Entmnt. Durables	Vehicles	Saving
Dependent Variable: Household Category Consumption/Disposable Income									
Log(80thPercentileIncome)	0.008 (0.016)	0.036** (0.015)	0.002 (0.004)	0.002 (0.002)	-0.008 (0.006)	-0.003 (0.021)	0.010 (0.009)	0.073** (0.032)	-0.230*** (0.060)
Dependent Variable: Household Category Consumption/Total Consumption									
Log(80thPercentileIncome)	-0.012 (0.016)	0.018 (0.013)	-0.001 (0.004)	-0.002 (0.003)	-0.035*** (0.003)	-0.013 (0.016)	0.001 (0.006)	0.028 (0.018)	

*Notes:* Each cell contains the result from a separate regression. The sample in Panel A consists of household-year observations of renters below the 80th percentile in the state-year income distribution. The sample in Panel B consists of household-year observations of homeowners below the 80th percentile in the state-year income distribution. The dependent variable is either defined as category-specific consumption over income or over total consumption for a given EVS household in a given state and year. We control for household characteristics, state and year fixed effects, state-specific time trends, unemployment rates and prices in all regressions. Data: EVS, 1998 to 2018.

Table A5: Expenditure Responses against Visibility or Status Relevance

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Estimated Expenditure Responses							
Sample:	x<80th, Renters				x<80th, Owners			
	All Categories		Excl. Saving		All Categories		Excl. Saving	
Visibility	0.052 (0.032)		0.067 (0.039)		0.387*** (0.119)		0.126 (0.076)	
Status		0.052* (0.027)		0.057* (0.029)		0.022 (0.134)		0.134** (0.052)
Constant	-0.028 (0.018)	-0.024* (0.013)	-0.037 (0.022)	-0.025* (0.013)	-0.212*** (0.066)	-0.009 (0.063)	-0.057 (0.043)	-0.046* (0.024)
Observations	18	18	17	17	18	18	17	17
$R^2$	0.138	0.187	0.164	0.208	0.397	0.002	0.156	0.307

*Notes:* In Columns 1, 2, 5 and 6, the sample consists of all 18 categories. In Columns 3, 4, 7, and 8, the sample is restricted to the 17 consumption categories (not including saving). The dependent variable is defined as the estimated category-specific coefficients from income share specifications in Table A4. Visibility and Status Relevance are the index values of the respective categories reported in Table 1. Results reflect the fit of regression lines in Figure 7.

Table A6: Income of the Rich and Non-Rich Income Satisfaction

	(1)	(2)	(3)	(4)
	Satisfaction with Household Income			
Sample:	x<80th			
Log(80thPercentileIncome)	-0.990**	-0.982***	-1.225***	-1.218***
	(0.350)	(0.312)	(0.333)	(0.299)
Q=2 × Log(80thPercentileIncome)			-0.108	-0.108
			(0.321)	(0.321)
Q=3 × Log(80thPercentileIncome)			0.204	0.208
			(0.369)	(0.368)
Q=4 × Log(80thPercentileIncome)			0.713**	0.716**
			(0.322)	(0.323)
Unemployment Rate		-2.506		-2.510
		(1.525)		(1.503)
State and year FEs	Yes	Yes	Yes	Yes
State-specific time trends	Yes	Yes	Yes	Yes
Household income FEs	Yes	Yes	Yes	Yes
Household & Individual controls	Yes	Yes	Yes	Yes
Quintile Indicator	Yes	Yes	Yes	Yes
Observations	308249	308249	308249	308249
$R^2$	0.205	0.205	0.206	0.206

*Notes:* The sample consists of individual-year observations below the 80th percentile in the state-year household income distribution. The dependent variable is the response to a survey question about an individual's satisfaction with their household's income. Q2, Q3, and Q4 indicate whether an individual lives in a household that ranks in the second, third or fourth quintile of the state-year income distribution. Data: SOEPv36, 1998 to 2018.

Table A7: Income of the Rich and Non-Rich Housing Consumption

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Housing Consumption/Income						
Sample:	x<80th		x<80th, Renters		x<80th, Owners		
Log(80thPercentileIncome)	0.055** (0.024)	0.055** (0.023)	0.052** (0.023)	0.031 (0.025)	0.025 (0.023)	0.095** (0.039)	0.096** (0.040)
Unemployment Rate		-0.015 (0.172)	-0.015 (0.174)	0.172 (0.212)	0.167 (0.211)	-0.120 (0.317)	-0.095 (0.328)
House Tenure			-0.001*** (0.000)		-0.002*** (0.000)		0.000* (0.000)
State and year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State-specific time trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household income FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	132301	132301	131579	87979	87508	44587	44335
R <sup>2</sup>	0.318	0.318	0.323	0.087	0.087	0.023	0.023

*Notes:* The sample consists of household-year observations below the 80th percentile in the state-year income distribution. In Columns 4 and 5, the sample is restricted to renter households and in Columns 6 and 7 the sample consists of homeowners. The dependent variable is defined as housing consumption over income for a given household in a given state and year. House Tenure is the number of years a household has lived in their current residence. Data: SOEPv36, 2000 to 2014.

Table A8: Home Equity Channel

	(1)	(2)	(3)	(4)
	Total Consumption/Income			
Sample:	x<80th, Owners			
Log(80thPercentileIncome)	0.270*** (0.082)	0.286*** (0.075)		
Pre2008 × Log(80thPercentileIncome)			0.293*** (0.075)	0.296*** (0.078)
Post2008 × Log(80thPercentileIncome)			0.206* (0.103)	0.209* (0.104)
Log(HousingWealth)	0.001* (0.001)	0.001* (0.001)		0.002* (0.001)
Unemployment Rate		-0.644 (0.401)	-0.464 (0.400)	-0.491 (0.400)
State and year FEs	Yes	Yes	Yes	Yes
State-specific time trends	Yes	Yes	Yes	Yes
Household income FEs	Yes	Yes	Yes	Yes
Household controls	Yes	Yes	Yes	Yes
Observations	66633	66633	66633	66633
$R^2$	0.100	0.100	0.100	0.100

*Notes:* The sample consists of household-year observations of homeowners below the 80th percentile in the state-year income distribution. The dependent variable is defined as total household consumption over income for a given EVS household in a given state and year. Log(HousingWealth) is the logarithm of total real estate wealth of a given household in a given year. Pre- and Post2008 are indicator variables for the time periods up to and after 2008. Data: EVS, 1998 to 2018.

Table A9: Local Price Channel

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Log(LocalCPI)		State-Year Panel EVS		x<80th		Total Consumption/Income			
Sample:	State-Year Panel SOEP	Panel SOEP	State-Year Panel EVS	State-Year Panel EVS	x<80th	x<80th	x<80th, Renters	x<80th, Owners	x<80th, Owners	x<80th, Owners
Log(80thPercentileIncome)	-0.013*		0.009		0.095***	0.103***	0.019	0.021	0.259***	0.271***
	(0.008)		(0.016)		(0.021)	(0.019)	(0.030)	(0.031)	(0.076)	(0.068)
Log(90thPercentileIncome)		-0.006		0.011						
		(0.006)		(0.016)						
Log(LocalCPI)					0.746**	0.463	0.476	0.355	0.755	0.482
					(0.336)	(0.291)	(0.497)	(0.453)	(0.783)	(0.905)
Unemployment Rate	-0.274***	-0.272***	-0.300***	-0.301***		-0.339**		-0.136		-0.506
	(0.032)	(0.032)	(0.076)	(0.075)		(0.151)		(0.178)		(0.456)
State and year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State-specific time trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household income FEs	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Household controls	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Observations	293	293	70	70	147237	147237	83779	83779	63458	63458
R <sup>2</sup>	0.999	0.999	0.999	0.999	0.116	0.116	0.134	0.134	0.098	0.098

Notes: In Columns 1 to 4 the sample is a state-year panel, covering all the state-years in the SOEP (Columns 1 and 2) and the EVS (Columns 3 and 4) included in our sample. The dependent variable is defined as the logarithm of the CPI in a given state and year. In Columns 5 to 10, the sample consists of household-year observations below the 80th percentile in the state-year income distribution. In Columns 7 and 8, the sample is restricted to renter households and in Columns 9 and 10 the sample consists of homeowners. The dependent variable is defined as total household consumption over income for a given EVS household in a given state and year. Log(LocalCPI) is the logarithm of the state-level CPI. Data: EVS and SOEPv36, 1998 to 2018.



Table A10: Income of the Rich and Non-Rich Future Incomes

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Log(HH income) in t+1	Log(HH income) in t+2	Log(HH income) in t+2	Log(HH income) in t+4	Log(Avg. HH income) t+1 to t+2	Log(Avg. HH income) t+1 to t+2	Log(Avg. HH income) t+1 to t+2	Log(Avg. HH income) t+1 to t+2	Log(Avg. HH income) t+1 to t+4	Log(Avg. HH income) t+1 to t+4	Log(HH income) t+1 to t+4	S.D. of Log(HH income) t+1 to t+4
Sample: x<80th, Owners												
<b>Panel A</b>												
Log(HH Income)	0.717*** (0.012)	0.717*** (0.012)	0.667*** (0.010)	0.667*** (0.010)	0.599*** (0.014)	0.599*** (0.014)	0.674*** (0.012)	0.674*** (0.012)	0.627*** (0.015)	0.626*** (0.015)	-0.071*** (0.011)	-0.071*** (0.011)
Log(80thPercentileIncome)	-0.012 (0.049)	-0.073 (0.070)	-0.008 (0.064)	-0.099 (0.073)	-0.025 (0.089)	-0.138 (0.094)	-0.014 (0.053)	-0.100 (0.058)	-0.047 (0.077)	-0.148* (0.082)	-0.044 (0.043)	-0.028 (0.046)
State-specific time trends	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	64667	64667	56773	56773	43365	43365	55932	55932	41911	41911	41911	41911
R <sup>2</sup>	0.653	0.653	0.597	0.597	0.533	0.533	0.704	0.704	0.701	0.701	0.044	0.046
<b>Panel B</b>												
Log(HH Income)	0.717*** (0.012)	0.717*** (0.012)	0.667*** (0.010)	0.667*** (0.010)	0.599*** (0.014)	0.599*** (0.014)	0.674*** (0.012)	0.674*** (0.012)	0.627*** (0.015)	0.626*** (0.015)	-0.071*** (0.011)	-0.071*** (0.011)
Log(90thPercentileIncome)	-0.016 (0.027)	-0.052 (0.031)	-0.093** (0.037)	-0.183** (0.062)	0.001 (0.051)	-0.064 (0.055)	-0.069** (0.026)	-0.136*** (0.043)	-0.073* (0.037)	-0.133*** (0.035)	-0.039 (0.030)	-0.032 (0.033)
State-specific time trends	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	64667	64667	56773	56773	43365	43365	55932	55932	41911	41911	41911	41911
R <sup>2</sup>	0.653	0.653	0.597	0.597	0.533	0.533	0.704	0.704	0.701	0.701	0.044	0.046

Notes: The sample consists of household-year observations of homeowners below the 80th percentile in the state-year income distribution. In Columns 1 to 6 the dependent variable is defined as the logarithm of the future income of a given household at different points in time as noted above. Dependent variables in Columns 7 to 10 are the logarithms of future household income averaged over different time horizons. Dependent variables in Columns 11 and 12 are the standard deviation of log household income from (t+1) to (t+4). We control for household characteristics, state and year fixed effects in all regressions. Data: SOEPv36, 1998 to 2018.

Table A11: Income of the Rich and Non-Rich Sentiments

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Worried about Household Finances				Worried about Economic Development			
Sample:	x<80th, Owners							
Log(80thPercentileIncome)	-0.039 (0.128)	-0.048 (0.128)			-0.005 (0.118)	-0.014 (0.118)		
Log(90thPercentileIncome)			-0.015 (0.104)	-0.029 (0.104)			0.110 (0.090)	0.096 (0.090)
Unemployment Rate		2.177*** (0.670)		2.179*** (0.670)		2.121*** (0.587)		2.095*** (0.586)
State and year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State-specific time trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household income FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household & Individual controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	125196	125196	125196	125196	124434	124434	124434	124434
R <sup>2</sup>	0.155	0.155	0.155	0.155	0.140	0.140	0.140	0.140

*Notes:* The sample consists of individual-year observations below the 80th percentile in the state-year household income distribution. The sample is restricted to individuals living in homeowner households. In Columns 1 to 4, the dependent variable is the response to a survey question about an individual's concerns about the economic situation of their household and in Columns 5 to 8 it is the response to the same question about the economy in general. Data: SOEPv36, 1998 to 2018.

Table A12: Counterfactual Saving Rates for Homeowners

	Quintile of Disposable Household Income			
	Q1	Q2	Q3	Q4
Marginal Effect of Log(80thPercentileIncome)				
Coeff.	-0.329	-0.209	-0.188	-0.160
SE	0.121	0.077	0.076	0.056
Panel A: Actual Household Saving Rates (in %)				
2003	-8.75	3.08	10.54	14.82
2008	-15.87	0.65	6.64	12.30
2013	-18.85	-1.08	6.03	14.26
2018	-7.88	3.96	12.80	17.53
Panel B: Difference under Counterfactual (in %)				
2003	0.92	0.64	0.14	0.07
2008	3.41	1.28	0.98	0.25
2013	5.39	2.17	1.50	0.40
2018	5.48	2.22	1.42	0.33
Panel C: Counterfactual Household Saving Rates (in %)				
2003	-7.84	3.73	10.68	14.89
2008	-12.46	1.93	7.62	12.55
2013	-13.46	1.09	7.53	14.66
2018	-2.39	6.18	14.22	17.85

*Notes:* The table reports actual household saving rates of homeowners by quintile of the income distribution (Panel A), estimated differences in their saving rates (Panel B) using the marginal effects of Log(80thPercentileIncome) on household saving rates reported at the top of the table under the counterfactual assumption that the income at the 80th percentile had increased at the same rate as that of the median household in each of the respective quintiles. Counterfactual saving rates of homeowners are reported in Panel C. Data: EVS, 1998 to 2018.

## Appendix B: Data Appendix

### 1. Additional Information on the German Income and Expenditure Survey (EVS) and the Socio-Economic Panel (SOEP)

#### *Background Information on the EVS*

The EVS is carried out quinquennially by the Federal Statistical Office of Germany and includes between 42,000 and 50,000 households in each wave. Each household records detailed consumption expenditures in a household diary for a period of three months. We exclude households with disposable household income less than or equal to zero and those with savings in excess of disposable household income or those who dissave more than two and a half times their disposable income. This leaves us with 49,463 household observations in 1998, 42,505 in 2003, 43,831 in 2008, 42,515 in 2013, and 41,977 in 2018 in our final dataset.

#### *Definition of Household Consumption*

We measure household consumption as discretionary expenditures. This is mostly reflected in our definition of housing consumption, as well as the measurement of consumption of large durables, as we do not rely on rental equivalence values for owner-occupied housing, the imputation of service flows for the consumption of vehicles as proposed by Bertrand and Morse (2016), or for other large durables, as suggested for the measurement of consumption in the EVS by Bartels and Schröder (2020). Hence, our measure of household consumption also differs from the national accounts' methodology. This is theoretically motivated by our intention to identify expenditures that directly derive from the current consumption and spending decisions of households. Imputed service flows do not coincide with actual spending decisions. Hence, we rely on effected cash flows. Additionally, the limited information in the EVS on the vehicle fleet owned by households, as well as the collective documentation of expenditures on vehicle purchases and the leasing of cars in some years would pose practical limitations to a reliable imputation of service flows for vehicles.

#### *Cut-Off for Top Incomes*

Households with a monthly net household income above 18,000 euros (2003 to 2018 waves) or 35,000 Deutschmarks (or 17,896 euros; 1998 wave) are excluded from the EVS, due to the limited willingness to participate of high-income households. Becker (2014) demonstrates that significantly less than 1% of the total population in Germany lies above this threshold. While a similar threshold is not implemented in the SOEP, only a few of the households in SOEP would be above it (Becker et al., 2003). However, the exclusion of households with extremely high incomes is of minor relevance to our theoretical and

empirical mechanism. The rise in income inequality in Germany was not due an U.S. style explosion of top income shares but manifested in falling incomes of the lower half of the distribution relative to the upper half. Hence, there were no relevant relative income losses for households in the upper-middle class or above.

#### *Mortgage Interest Payments for Owner-Occupied Housing*

The 1998 and 2003 waves only contain information on overall mortgage interest payments, including payments for mortgages on other properties than the owner-occupied home. We predict the interest payments for mortgages on the owner-occupied home for the 1998 and 2003 waves based on coefficients obtained from the EVS waves 2008, 2013 and 2018. We regress interest payments for mortgages on non-owner-occupied properties on household characteristics, the sum of outstanding mortgages and overall mortgage interest payments in the 2008, 2013 and 2018 waves. We then predict the amount for the 1998 and 2003 waves and deduct it from the overall mortgage interest payments to arrive at mortgage interest payments for owner-occupied housing.

#### *Background Information on the SOEP*

The SOEP is an annual household panel. We utilise the waves from 1998 to 2018 from the SOEPv36. We construct our variables in the SOEP to align them as closely as possible with those in the EVS. Household income is the sum of labour income, asset income, private and public transfers net of taxes and social security contributions. SOEP households do not give account of their overall consumption expenditures, yet housing expenditures are recorded in a comparable fashion as in the EVS. We construct housing consumption as the sum of mortgage interest payments, maintenance and operating costs for owner-occupiers and rents paid for renters. Mortgage interest payments are only recorded in combination with mortgage repayment in the SOEP. We follow the methodology of Dustmann et al. (2022) to derive mortgage interest payments out of total mortgage payments based on information from the EVS. We can only construct a consistent housing consumption variable for the years 2000 to 2014, due to various changes in the SOEP survey questionnaire that affect the measurement of operating costs and rents and are associated structural breaks in the data.

## **2. Survey on Visibility and Status Relevance**

#### *Background Information*

In May 2022 we conducted an online survey on the visibility and status relevance of various components of household consumption and saving. Survey participants were required to reside in Germany and to be between 18 and 75 years old at the time of the survey. Our sample was selected to be representative of the overall German population by age, gender,

net household income and state of residence. Our initial sample included a total of 1920 individuals. These were randomly assigned to either answer the question on visibility or the question on status relevance. We excluded 58 observations of individuals who did not meet our minimum requirement for the time used to complete the questionnaire. This leaves us with a final sample of 1862 observations, of which 936 completed the questionnaire that includes the visibility question and 926 completed the questionnaire that includes the question on status relevance.

Besides a question on either visibility or status relevance, the survey questionnaire included questions on the sociodemographic characteristics of our participants. Specifically, we asked about their age, gender, professional education, employment status, marital status, homeowner status, household size and net household income. In Table B1 we show summary statistics for the two subsamples, as well as results from tests for equality of means across the subsamples. We do not find a statistically significant difference in means for any of the recorded sociodemographic characteristics. This suggests that differences in our indices of visibility and status relevance are not due to differences in sample composition.

#### *Survey Questions on Visibility and Status Relevance*

Translated from German, the full text of our visibility question reads “You can now see some things you can or have to spend money on in everyday life. Imagine you meet a person who lives in a household similar to yours. This household is different from others only in that it spends more money on [category title]. When do you think you will notice this?” Our question on status relevance shares the same initial set-up as the visibility question and only differs with regard to the concluding question. It reads “You can now see some things you can or have to spend money on in everyday life. Imagine you meet a person who lives in a household similar to yours. This household is different from others only in that it spends more money on [category title]. What do you think, is this considered a symbol of higher status in your social environment?” Response options to the visibility question are (1) Immediately, (2) After a short time, (3) After some time, (4) After a long time, and (5) Never. Response options to the status relevance question are (1) Absolutely, (2) Rather yes, (3) Maybe, (4) Rather not, and (5) Absolutely not. Both include the option (99) Don’t know. Screenshots of the original survey questions, as presented to the participants in the web interface, are presented in Figure B1.

Any survey participant had to answer the respective question 18 times, for each of our categories from Table A1, which were displayed at [category title] in random ordering for each respondent. Table B2 shows the full category titles for our survey (Column 3) and the distribution of replies. We follow Heffetz (2011) by assigning equidistant values between 0 and 1, of which we calculate mean values by category over the entire sample, to arrive at the index-values in Table 1. For both questions the value 1 is assigned to

response option (1), response option (2) is 0.75, response option (3) is 0.5, response option (4) is 0.25, and response option (5) is 0.

## References Appendix

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Sie sehen nun einige Dinge, für die man im Alltag Geld ausgeben kann oder muss.

Stellen Sie sich vor, Sie lernen eine Person kennen, die in einem ähnlichen Haushalt lebt wie Sie. Dieser Haushalt unterscheidet sich nur dadurch von anderen, dass er mehr Geld ausgibt für ...

**Bekleidung, Schuhe und Schmuck**

Was glauben Sie, wann fällt Ihnen das auf?

Sofort	Nach kurzer Zeit	Nach einiger Zeit	Nach längerer Zeit	Nie	Weiß nicht
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

weiter ...

(a) Online Survey Screenshot of Visibility Question

Sie sehen nun einige Dinge, für die man im Alltag Geld ausgeben kann oder muss.

Stellen Sie sich vor, Sie lernen eine Person kennen, die in einem ähnlichen Haushalt lebt wie Sie. Dieser Haushalt unterscheidet sich nur dadurch von anderen, dass er mehr Geld ausgibt für ...

**Bekleidung, Schuhe und Schmuck**

Was glauben Sie, gilt das in Ihrem Umfeld als Symbol für einen höheren Status?

Auf jeden Fall	Eher ja	Vielleicht	Eher nein	Auf keinen Fall	Weiß nicht
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

weiter ...

(b) Online Survey Screenshot of Status Relevance Question

Figure B1: Online Survey

Table B1: Summary Statistics, Survey on Visibility and Status Relevance

	Visibility			Status Relevance			t-test	
	N	Mean	Std. Dev.	N	Mean	Std. Dev.	t-stat	p-value
Age	936	47.99	15.54	912	46.95	15.62	1.43	0.15
Male	936	0.45	0.50	912	0.48	0.50	-1.41	0.16
College degree	936	0.26	0.44	912	0.27	0.44	-0.33	0.74
Employed	936	0.63	0.48	912	0.62	0.49	0.29	0.77
Married	936	0.50	0.50	912	0.48	0.50	0.84	0.40
Homeowner	922	0.41	0.49	892	0.42	0.49	-0.31	0.76
Household size	915	2.31	1.15	887	2.33	1.17	-0.29	0.78
Net household income	936	3429	3687	912	3257	1941	1.25	0.21

*Notes:* The table shows summary statistics for the two subsamples of our online survey, as well as results from tests for the equality of means. The first subsample was asked to answer the question on the visibility and the second on the status relevance of private expenditures. Data: Own survey.

Table B2: Expenditure Categories

	(1) Category	(2) Survey Title
1	Clothing & Jewellery	Bekleidung, Schuhe und Schmuck
2	Housing	Miete oder Wohneigentum
3	Food at Home	Nahrungsmittel und Getränke für den Verzehr zu Hause
4	Food Out	Speisen und Getränke außer Haus
5	Alcohol & Tobacco	alkoholische Getränke und Tabakwaren
6	Personal Care	Dienstleistungen und Güter für die Körperpflege (z.B. Friseur, Kosmetik)
7	Telephone & Internet	Mobiletelefon, Telefon und Internet
8	Print Media	Bücher, Zeitschriften und Zeitungen
9	Entertainment Services	Unterhaltungsdienstleistungen (z.B. Kino, Konzert, Museum, Pay TV, Sportveranstaltungen, Theater)
10	Energy	Energieversorgung (z.B. Heizung, Strom, Warmwasser)
11	Holidays	Urlaubsreisen und sonstige private Flüge
12	Public Transportation	Nutzung von öffentlichen Verkehrsmitteln (z.B. Bus und Bahn)
13	Education	Bildung und Kinderbetreuung (z.B. Kindergarten, Musik- und Sportunterricht, private Nachhilfe, Privatschule)
14	Health	Gesundheit (z.B. Medikamente, private Arztleistungen, Zusatzversicherung)
15	Furnishings	Wohnungsausstattung und -dienstleistungen (z.B. Haushaltshilfe, Kühlschrank, Möbel, Waschmaschine)
16	Entertainment Durables	Geräte für Freizeit, Sport und Unterhaltung (z.B. Computer und Spielkonsole, Fahrrad, Musikinstrument, Spiele, Sportartikel)
17	Vehicles	Kauf und Unterhalt von Kraftfahrzeugen (z.B. Auto, Motorrad)
18	Saving	Sparen (z.B. Sparkonto, Aktien, Anleihen)

*Notes:* The table shows the german description of the expenditure categories as presented to the respondents in our survey on visibility and status relevance.

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