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Income Inequality, Consumption and Status Competition in Germany

Jan Behringer, Lukas Endres and Till van Treeck*

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Abstract

We ask what explains the substantial 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. Using household survey data over the period from 1998 to 2018, we document that the reduction in saving rates at the lower end of the income distribution was largely driven by low-income homeowners, who expanded their income shares allocated to housing consumption alongside changes in income inequality. We propose that these trends in consumption and saving of the non-rich might be directly linked to rising income inequality through upwards directed social status comparisons. We conduct our own survey to identify areas of private consumption where social comparisons matter most. Our results suggest that housing expenditures, especially regarding homeownership, might be key to social status. Our empirical analysis shows that non-rich homeowners' spending out of income is positively linked to rising income inequality. Non-rich owner-occupiers that face rising incomes at the top of the distribution in their state of residence spend larger shares of their income and save less, holding own incomes, other sociodemographic and regional characteristics constant. Consistent with a status-seeking explanation of this result, we find that all 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. While renter households offset higher status consumption by reducing expenditures on other consumption components, homeowners maintain higher status-oriented consumption, particularly regarding housing, by considerably reducing their saving rates.

JEL Classifications: D1, D31, E21, R21

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1. Introduction

Income inequality in Germany started to rise substantially in the early 2000s (Fuchs-Schündeln et al., 2010; Biewen and Juhasz, 2012), primarily driven by declining real incomes of households in the lower 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; Bartels and Schröder, 2020). Recent work suggests that disproportionately increasing housing expenditures of lower income households played a key role in explaining why consumption inequality increased less than income inequality (Dustmann et al., 2022). This resulted in a reduction of saving rates for lower income groups and a spread of saving rates along the income distribution, with potentially far-reaching implications for wealth inequality (Saez and Zucman, 2016). This paper investigates the role of rising income inequality in Germany for household consumption behaviour in explaining the relatively small rise of consumption inequality and the disproportionate decrease of saving rates among lower income households.

To understand these trends, we propose a mechanism in which upwards directed social status comparisons allow for a direct link between rising incomes or consumption at the top and spending of the non-rich (Bertrand and Morse, 2016; Frank et al., 2014; Veblen, 2009). We conduct a survey among a large representative sample of approximately 1900 individuals in Germany, to identify areas of private consumption where social comparisons might matter most. We expand prior surveys of consumption visibility (Charles et al., 2009; Heffetz, 2011) with a new measure of status relevance and by including saving as an additional use of disposable household income. Conventional visibility measures operationalise the capacity of consumption expenditures to serve signalling motives. Our novel measure of status relevance complements this by additionally incorporating the extent to which an improved relative consumption position reflects positional or competitive advantages.

One key finding of our survey concerns the saving category, which is most inconspicuous yet ranks at the upper end of the status relevance scale. Yet, as saving represents future consumption it poses an important intertemporal status trade-off to households. They can either forego saving for the sake of higher visible and other status-relevant expenditures and thus convey more immediate signals of wealth and status. Or restrain their consumption at the benefit of higher (future) status enhancing savings. Our theoretical argument as well as our survey results suggest that housing consumption, especially with respect to homeownership, might be key to social status. Unlike any other consumption category, spending on residential property is

classified as consumption yet also associated with wealth accumulation, which in some cases enables households to overcome the intertemporal trade-off posed by saving.

The central empirical part of our paper relies on household microdata from the German Income and Expenditure Survey (EVS). We construct a consistent cross-sectional dataset of household consumption by harmonising the five waves of the EVS between 1998 and 2018. In parts of our analysis, we additionally draw on household data from the Socio-Economic Panel (SOEP), which we primarily employ for its panel component.

In contrast to previous work, we show that the reduction in saving rates at the lower end of the income distribution was largely driven by low-income homeowners (and not renter households), who expanded their income shares allocated to housing consumption alongside changes in income inequality. We find that consumption-saving behaviour of these households directly correlates to the rise in income inequality. Based on state-year variation in incomes of the rich, we show that spending out of income of non-rich homeowners is positively related to rising income or consumption expenditures of households at the top of the distribution. Non-rich owner-occupiers that face higher incomes or expenditures of top income households in their federal state of residence spend more and larger shares of their income and save less, holding own incomes and other sociodemographic characteristics constant. Our analysis of different components of household consumption shows that this finding is consistent with a status-seeking explanation. All 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 spending on other consumption components. In contrast, homeowners maintain higher status-oriented expenditures and particularly highly visible and status relevant consumption expenditures associated with real estate property by considerably reducing their saving rates. This direct 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 in order to maintain their aspired relative standard of living by participating in the market for residential property.

We conduct a series of robustness tests to rule out that competing non-causal explanations might be underlying to our estimated relationship between rising top incomes and non-rich homeowners' consumption out of income. Our results do not yield any support for alternative explanations of our findings based on residential mobility, housing wealth effects, a local price channel or the permanent income hypothesis and a life-cycle theory of consumption.

Our paper adds to research on status consumption 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). We find that consumption effects of status comparisons in Germany were much more limited vis-à-vis the U.S. 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. Due to the high perceived status relevance of saving by individuals in Germany, households were mostly only willing to reduce their saving for highly visible and status-relevant housing expenditures, particularly when associated with residential property.

Our findings also complement the relatively limited microeconomic evidence that indicated that status comparisons are linked to consumption behaviour of private households in Germany (Drechsel-Grau & Schmid, 2014; Friehe & Mechtel, 2014). It is not well understood what role these effects play in explaining overall trends in consumption and saving under surging income inequality in Germany over recent decades. We demonstrate that social comparisons substantially contributed to falling saving rates of lower income households, thereby strongly limiting the increase in consumption inequality relative to income inequality.

Our research 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 inequality and prevented wealth accumulation (Dustmann et al., 2022). Instead, we show that the increase in expenditure shares on housing was largest for homeowners, who had substantially lower saving rates than their renter counterparts and thus were not better off regarding wealth accumulation.¹ Our results suggest that low-income renters in highly regulated markets fared better than homeowners in times of surging income inequality, which casts doubt on calls to promote homeownership through further deregulation.

The remainder of this paper is structured as follows. In Section 2 we theoretically discuss the link between income inequality and private household consumption. Subsection 3.1 describes our main datasets and Subsection 3.2 provides an overview of our own survey on the visibility and status relevance of private consumption. In Section 4 we document key developments of income inequality, private household consumption and saving. Section 5 presents our empirical results on the link between rising income inequality and household consumption. In Section 6 we present evidence on the proposed status-seeking mechanism and Section 7 explores the robustness of our findings. Section 8 concludes.

¹ Not accounting for unrealised capital gains, which likely did not play an important role during our period of observation, considering the limited developments of house prices in Germany.

2. Theoretical Background

Traditionally, research on the interplay of income inequality, consumption and saving resorts to explanations based on the permanent income hypothesis (Friedman, 1957) and the life-cycle theory of consumption (Modigliani and Brumberg, 1954). Bartels and Schröder (2020) hypothesise that increasing income inequality in Germany, supposedly driven by transitory income shocks, did not translate into more unequal consumption, as households could smooth their consumption by adjusting their saving. However, regarding inequality developments in Germany in recent decades this interpretation can largely be refuted on empirical grounds, as the rise of income inequality around the beginning of the latest century was largely ascribed to a substantial increase in the dispersion of the permanent component of incomes (Bartels and Bönke, 2010; Fuchs-Schündeln et al., 2010).

A recent contribution by Dustmann et al. (2022) brought attention to the role of housing consumption in amplifying income inequality and disguising the genuine increase in (non-housing) consumption inequality. The authors propose an analysis of incomes net of housing expenditures, to better understand welfare implications of changes in income inequality. Dustmann et al. (2022) base their analysis on a theoretical model aimed at explaining the disproportionate increase of income shares allocated to housing and associated saving rate reductions, particularly for households at the lower end of the income distribution. A fundamental component of their model is the classification of housing consumption as the only necessity, to which all households must allocate a fixed amount to pay for their subsistence, and all other consumption as non-necessities. This distinction gives rise to some of the key implications of their model regarding the explosion of housing expenditures (relative to income) for low-income households. Their central argument in explaining the differential evolution of housing consumption and related saving rate developments along the income distribution is that housing price increases for low-income households relative to prices paid by richer households yield differential housing income shares along the income distribution. In practice this then boils down to differential changes in the cost of housing for homeowners versus renters, as low-income households are predominantly renters for whom rent increases supposedly drove up housing expenditures whereas higher income households are increasingly homeowners, who benefitted from falling mortgage interest rates. Other theoretical and empirical contributing factors include trends in household size, regional mobility towards more expensive urban areas and declining real incomes of lower income groups.

While we do acknowledge that these factors contribute to consumption and saving trends, we deem these explanations unsatisfactory both theoretically and empirically. In our “age of

abundance” rich societies close in on solving the economic problem of absolute need satisfaction (Keynes, 1930). With basic material need satisfaction becoming negligible every aspect of consumption should eventually be driven by a class of ever insatiable relative needs, rendering utility from consumption of any item increasingly dependent on the relative consumption position. Thus, making conventional theoretical consumption models that rely on such a dichotomous distinction into necessities and non-necessities obsolete. Instead, we like to think of private consumption behaviour in a more generalised way, in which interpersonal comparisons provide a comprehensive explanation of spending patterns, allowing us to embed any single consumption component irrespective of its quantitative importance.

Our theoretical framework is motivated by research from the U.S. that originated in the context of the private debt crisis. For the U.S., where rising income inequality was primarily driven by an explosion of top income shares (Piketty and Saez, 2006), it is argued that social comparisons and positional competition played a key role in explaining the ensuing private consumption boom and the widespread reduction of saving rates along the entire income distribution in the run-up to the global financial crisis. Status-driven housing consumption and particularly the expansion of homeownership were crucial in understanding these trends (Bertrand and Morse, 2016; Frank, 2013; Rajan, 2010).

Associated theories of expenditure cascades (Frank et al., 2014) or trickle-down consumption (Bertrand and Morse, 2016) build on the relative income hypothesis (Duesenberry, 1949) and the notion of upwards-directed status 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, households with relative income losses will spend a larger share of their income to maintain their relative consumption position with regards to higher-income households, especially in areas that they perceive as most relevant to their socioeconomic status. This can lead to lower spending on non-positional (yet welfare-enhancing) consumption goods and reduced saving.

Following Heffetz and Frank (2011) we argue that two central aspects make higher status desirable. 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 expenditures allow households to signal their financial well-being and socioeconomic status, as an end in itself. We consider this the consumption value of an improved relative standing (Heffetz and Frank, 2011).

On the other hand, we can regard status as a long-term investment in social or human capital. Higher relative consumption could have an asset or instrumental value (Heffetz and Frank, 2011), in so much as a household's current relative consumption position determines future income and thus consumption. This might for example be the case for housing expenditures. Spending more on housing relative to others today can allow households to move to the most desirable neighbourhoods, which in turn might provide access to better schools for children or important social networks, thereby positively affecting future income prospects.

3. Data

3.1. 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.² The EVS consists of repeated cross-sections, with about 40.000 to 50.000 households participating in each wave. Our analysis employs the waves of 1998, 2003, 2008, 2013 and 2018.³ Besides the large sample size, the main advantage of this dataset is the highly detailed account of household expenditures. This allows us to divide total household 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.

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. To ensure the validity of observations and to make sure that our results are not driven by some outliers, we exclude households who report to dissave more than two and a half times their disposable income.

Total household consumption is measured as the sum of all private consumption expenditures. House purchases are excluded from total expenditures. Instead, we define housing consumption of owner-occupiers as expenditures on maintenance and repairs⁴, operating costs, and mortgage

² A detailed documentation of the EVS waves is available at the Federal Statistical Office of Germany (2008a; 2008b; 2012; 2016; 2021).

³ We do not include earlier waves due to far-reaching changes in survey mode, structural breaks, and ensuing concerns about comparability of the data.

⁴ 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.

interest payments for the owner-occupied home.⁵ Unlike related contributions (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.

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.

3.2. Visibility and Status Relevance

In order to empirically assess our proposed mechanism, we supplement the EVS with our own survey, in which we operationalise the extent to which considerations about a perceived consumption or asset value of higher relative spending 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. 917 participants answered the question on consumption visibility and the other 912 answered the question on status relevance.⁶

We measure visibility by asking respondents how quickly they would notice above average expenditures on one 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. The visibility question is based on the survey design of Heffetz (2011) and intends to capture the noticeability of higher expenditures, in line with Veblen’s (2009) concept of conspicuous consumption. We assume that the more observable a consumption good is in social interactions, the more suitable it is as a signal of financial well-being and hence the more satisfaction or utility can be derived from higher consumption relative to others.

⁵ 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. 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 the Data Appendix (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 owner-occupied residential property or not.

⁶ 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.

Our second measure is designed to capture the status relevance of a given commodity. It is supposed to additionally incorporate the instrumental value of status and comes from a question that asks respondents whether they perceive above average expenditures of households similar to theirs in any of our categories as a symbol for higher status. We translate answers ranging from “Absolutely not” to “Absolutely” into a measure of status relevance that lies between 0 and 1. The question is conditional on having noticed higher expenditures by others and thus captures the status relevance of a given category irrespective of its observability and its resulting suitability as a signal. It goes beyond the visibility measure in so far as it also recognises competitive or positional advantages (Frank, 2008) associated with an improved relative consumption position.

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 one of the highest rated when it comes to status relevance. This finding validates our choice of question and survey design in identifying consumption and asset values as key functions of an improved relative spending position. 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. On the other hand, higher saving and the associated wealth accumulation can directly translate into higher future relative consumption in two ways. Wealth can be a source of income and thus saving more than others today will improve a household’s future relative income position and allow for higher relative spending. At the same time future consumption can directly be sourced out of wealth, making the act of saving an intertemporal status trade-off. Therefore, saving poses an important decision for households engaged in positional competition. They can either reduce their saving rate in favour of higher visible spending and thus send more immediate signals of financial prosperity and socioeconomic standing. Or they can hold back on visible spending in favour of higher (future) 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 overall consumption relative to income would have a positive net effect on the status relevance of the overall income use.

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.

Housing ranks highly on the scale of both visibility and status relevance. It is one of the key categories of our survey and might play a special role in status competition. Through their visibility, housing related consumption expenditures are immediate, highly observable signals of social standing. Additionally, housing is associated with various other positional consumption effects. As previously discussed, being willing to spend more on housing than others might be key in moving to desired areas, thereby gaining access to public infrastructure, such as schools, childcare or public transportation, and to beneficial social networks which can improve own economic outcomes and hence boost social status dynamically.

Specifically regarding homeownership, housing expenditures may play a special role in status competition beyond their dual function regarding visibility and status relevance. In contrast to all other consumption categories, spending on residential property is classified as consumption yet also associated with wealth accumulation. Thus, if households expect rising house prices, they can to some extent overcome the intertemporal status trade-off posed by saving, incur higher income shares on housing expenditures and reduce their saving rates while having higher visible and status relevant income allocations. A precondition for this synergy between visible and status-relevant housing consumption and real estate wealth accumulation is an increase in real house prices relative to the prices of other assets. Hence, higher status-driven housing expenditures relative to household income and lower savings might expose households to increased financial risks in case of housing market downturns, which particularly applies to low-income households.

Other categories that could potentially function in a similar way as housing are education and health. However, access to these is largely guaranteed by the public provisioning system in Germany, which is likely reflected in the low visibility and status relevance assessment of health and education expenditures by our survey respondents. Hence, housing is the only consumption good that can achieve an investment purpose yet is not largely de commodified, which likely makes it a key category for expenditure-driven status competition.

4. Income Inequality, Consumption and Saving in Germany

Personal income inequality in Germany rose substantially during the 2000s. The period between 1999/2000 and 2005 featured increases that were unparalleled among other OECD countries (OECD, 2008). Figure 2 shows the development of disposable household incomes and consumption relative to 1998, and household saving rates for the period between 1998 and 2018.

Stagnating or falling real incomes of households in the lower half of the income distribution until 2013 were associated with strongly declining relative incomes and led to widening income differentials (Figure 2(a)). Lower income households did not reduce their consumption expenditures (Figure 2(b)) in proportion to their falling incomes and instead maintained absolute as well as relative consumption levels by reducing their saving rates (Figure 2(c)). 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 tremendously reduced their saving rates, which accounts for the brunt of the overall saving rate reduction (Figure 3(b)). In stark contrast to homeowner households, the subpopulation of renters in the lowest quintile of the income distribution maintained constant saving rates (Figure 3(a)).

To better understand these trends and the special role of housing, 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). The substantial saving rate reductions of low-income owner-occupiers are mostly accounted for by increased housing and energy expenditures relative to disposable income, as well as in absolute terms. Between 1998 and 2008, the period which marks the highest increase in income inequality, equalised annual housing expenditures of homeowners in the lowest quintile rose by roughly 38.15% from 1405€ to 1941€. As a result, the share of disposable incomes allocated to housing rose by 6 percentage

points before peaking at 19% in 2008. During the same period energy expenses of homeowners in the lowest quintile increased by 402€, from an initial 1048€, eating up another 5% of disposable household incomes. The combined increase of housing and energy expenditures of homeowners between 1998 and 2008 amounts to 938€ or an additional 11% of disposable household incomes, making it a total of 33%. During the same period renters in the first quintile increased their expenditures on housing by 11.2% from 3279€ to 3647€ and their equivalised energy expenses rose on average by a much more modest 89€, jointly accounting for an additional 8% of disposable household income, which equals 457€. 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 -7% in 1998 to -16% in 2008. Unlike homeowners, renter households in the first quintile maintained their saving rates, despite their 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 also observable, yet 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 constant or slightly increasing 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. The mostly uniform absolute increase in housing and energy expenses of renter households is associated with income share increases that decrease with household income. 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 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 non-behavioural 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) entirely disregards developments for low-income homeowners that are much more crucial in understanding the overall trends and

particularly 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 costs of homeownership relative to rental prices (Figure 5)⁷, which raises the question why homeowners increased expenditures and income shares on housing at the expense of their savings by so much more than renters.

Interestingly, housing and energy expenditures of both groups converge with increasing income rank, as increases become larger for renters yet diminish for homeowners. Differences are most pronounced for the first quintile, still visible in the second and third quintile and completely vanish for the top two quintiles. Hence, 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 of low-income households, particularly regarding homeownership.

5. 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 the income distribution for each state⁸ and year and restricting our sample to households below the 80th percentile of their regional income distribution. We borrow our terminology from Bertrand and Morse (2016) by referring to households below the 80th percentile of their respective income distribution as non-rich and those above as rich. We then analyse the relationship between changes in the income distribution and consumption expenditures of non-rich households by assessing how the consumption expenditures of a given non-rich household respond to rising incomes (or consumption)⁹ of the rich. We conduct subsample analyses for homeowners and renters, as understanding the distinct consumption and saving behaviour of owner-occupiers and renters at the bottom of the income distribution is key to explaining overall saving rate developments.

⁷ Both renters and homeowners increased their expenditures on housing in absolute terms and relative to their disposable incomes despite falling rents and house prices.

⁸ Due to relatively small sample sizes, we group the three city-states Hamburg, Berlin, and Bremen, as well as the Saarland with adjacent states.

⁹ 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.

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 socio-demographic characteristics:

$$\omega_{ist} = \alpha + \beta \ln(\bar{y}_{st,p=0,80}) + \gamma X_{ist} + \delta I_{ist} + \theta state_s + \mu year_t + \varepsilon_{ist}$$

The dependent variable ω_{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_{ist} 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 that indicates whether the household head holds a German citizenship. Following Bertrand and Morse (2016), we nonparametrically control for total household income with the 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 heteroskedasticity robust standard errors at the regional level and apply cross-sectional population weights.

Results are reported in table 2. 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 0.112 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 the rich, as we argue that non-rich households increase their consumption expenditures relative to 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 $\text{Log}(80\text{thPercentileIncome})$. 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 A2 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 consumption 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 estimate our model while allowing for heterogeneous effects along the four quintiles of the income distribution that are included 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.

6. 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 our 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 ranker higher on our visibility and status indices, if changing consumption and saving patterns of non-rich households are motivated by concerns about relative standing. Accordingly, the extent to which household spending on different items responds to relatively declining incomes should be systematically related to our measures of visibility or status relevance for the respective categories.

We divide household expenditures in the EVS into the earlier described 18 categories. 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:

$$\omega_{ist}^k = \beta \ln(\bar{y}_{st,p=0,80}) + \gamma X_{ist} + \delta I_{ist} + \ln\left(\frac{p_{st}}{P_t}\right) + \theta state_s + \mu year_t + \tau statetrend + \varepsilon_{ist}$$

where ω_{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 of the model is analogous

to the baseline model.¹⁰ 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 A3 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 the one for renter households. Another category with large and significant positive income share responses for both homeowners and renters is holidays. Both housing and holidays rank at the top of both the visibility and the status relevance index. Two other categories with comparable visibility and status relevance values are vehicles and furniture. 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 this large expansion of consumption relative to income of owner-occupiers we only estimate some minor income share reductions in 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 any positive consumption responses seem to be compensated by income share reductions on other consumption categories.

In figure 6 we plot the estimated coefficients for renters (Figure 6(a)) and homeowners (Figure 6(b)) from our income share specifications against the measures of visibility and status relevance for the respective categories. The associated correlations are reported in table A4 of the appendix. The dashed line in Figure 6 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 categories that are more visible and status relevant when facing higher consumption or income at the top of the income distribution. This

¹⁰ 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.

result is a strong indicator for increased status-seeking of non-rich households in response to rising income inequality.

The solid lines in figure 6 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 in our subsample of homeowners when we take into account the large saving rate reduction as incomes at the top rise. 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 be an expression of status orientation if it occurs in favour of the three categories with a higher status relevance than that of 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. Our results show that the reduction in saving rates among non-rich owner-occupiers is entirely due to an expansion of spending in the three categories that are more status-relevant than saving. Hence, the non-positive correlation of income share reallocations and our measure of status relevance in figure 6(b) due to the large negative saving rate response of homeowners is not conflicting with status seeking. For non-rich homeowners, housing expenditures account for about half of the total effect on consumption expenditures with a higher status relevance than that of saving. These highly status-oriented expenditures on housing come at the expense of saving, particularly for households at the lower end of the income distribution.

For renter households, we find no negative effect on savings and only an insignificant effect on consumption in the status-relevant categories. In contrast to our sample of homeowners, slightly higher saving rates and expenditure shares allocated to the most status-relevant categories of non-rich renter households are offset by a significant reduction in expenditure shares of other less status-relevant consumption categories. The shift in consumption towards more visible and status-relevant expenditures, which also strongly centres around their housing expenditures, does not come at the expense of saving, but instead is offset by a reduction of other consumption expenses.

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 and relative income losses, which we interpret as strong evidence of status-seeking behaviour of non-rich households. Overall, we estimate the largest consumption responses for housing for all households, which we previously identified as a key category regarding social status. Effects are much smaller for renters, for which prices and demographic composition effects likely played a large role in explaining the expansion of housing income shares (Dustmann et al., 2022). Income shares allocated to owner-occupied housing rise even more with top income levels. Particularly striving for social status through residential property might account for a large portion of the income share increases allocated to housing and are central contributors to the large saving rate reductions of lower income homeowners.

In table A5 of the appendix we provide supplementary evidence on the behavioural mechanism, by showing that non-rich individuals report lower income satisfaction when incomes at the top of the distribution rise relative to their households income (columns 1 to 3). Interestingly, when we allow for heterogeneity of the effect along the quintiles of the income distribution in columns 4 to 6, we find that the same income groups for which consumption expenditures were most responsive to rising incomes at the top also become more likely to express dissatisfaction with their incomes. Hence, relative income losses correspond to declining income satisfaction, suggesting that households are well aware of their relative position, which in turn is deterministic of their perceived needs.

7. 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 that some unobserved confounder might be underlying to our results. Therefore, we conduct a series of empirical robustness tests in which we address the most likely competing explanations of our result.¹¹ In testing some of these alternative explanations we rely on the SOEP for its panel component. In the SOEP households are not asked to provide information about their overall consumption expenditures. However, households are questioned

¹¹ Most of our tests for the alternative explanations of our baseline finding rely on empirical strategies as described by Bertrand and Morse (2016).

on their housing expenditures.¹² To cross-check our finding with this additional dataset and make sure that our results are not driven by some artefact unique to the EVS, we first replicate our baseline analysis for housing consumption.¹³ Columns 1 and 2 in table A6 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 again 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, which makes us confident that our results indicate the true effect.

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. We investigate this mechanism by directly controlling for the effect of housing tenure¹⁴ on housing consumption relative to income. The results in columns 3, 5 and 7 of table A6 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 estimated coefficient on `Log(80thPercentileIncome)` does not pick up any relationship between the frequency of residential moves and housing expenditures of the non-rich.

B. Wealth Effects

Rising top income levels in a given state might be positively correlated with house prices (Matlack and Vigdor, 2008). Such a relationship 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 et al., 2013; Mian and Sufi, 2011).

We draw on information in the EVS on households' real estate wealth and empirically assess this mechanism by directly controlling for `Log(RealEstateWealth)` in a replication of our

¹² 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.

¹³ The analysis of housing consumption based on the SOEP in table A6 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.

¹⁴ Housing tenure is defined as the number of years since the household moved into its current residence.

analysis for the subsample of homeowners in table 2. Results are reported in table A7. As theoretically predicted, the coefficient on $\text{Log}(\text{RealEstateWealth})$ enters positively. However, the estimated coefficients on $\text{Log}(\text{80thPercentileIncome})$ and $\text{Log}(\text{90thPercentileIncome})$ are virtually unchanged in each of our specifications.

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 A8, 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 A8 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 and 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 households that decided to spend more and dissave when incomes at the top of the distribution rose did so because they had improved income prospects. In table A9 we 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 variable. We do not find a positive effect of incomes at 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 even imply a negative relationship.¹⁵

In table A10 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 overall economic development. We conduct this analysis 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 A9. Both oppose the notion that a positive relationship between income developments at the top and future household income (expectations) of the non-rich might be underlying to our main finding.

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 A9 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 $t+4$.

¹⁵ We obtain comparable results for the sample of renters (available on request).

8. 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 documented overall increase in household consumption and particularly housing consumption relative to income in the bottom half of the income distribution coincides with sharp increases in income inequality. We show that much of the decline in household saving rates and the consumption expansion of lower income households is attributable to status seeking motives. Falling relative incomes led to a prioritization and thus focusing of disposable incomes toward status-relevant and visible uses by lower- and middle-income households.

Our identification of housing consumption and particularly residential property uncovers close similarities with results from the U.S., where rising income inequality and a status-driven consumption expansion with a strong focus on homeownership played a central role in explaining the widespread reduction of household saving rates in the build-up of the financial crisis (Bertrand and Morse, 2016; Rajan, 2010). Yet, the magnitude of the effect is much smaller than what comparable estimates suggest for U.S. households (Bertrand and Morse, 2016) and 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 thing, our results suggest that this might be due to the more limited increase in income inequality, which mostly affected households 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. These finding also adds to the literature that finds comparatively high saving rates of Germanys middle class (Albers et al., 2022).

On the other hand, we find that housing consumption responses are mostly restricted to 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 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 & Schuetz, 2017).

Our findings also offer a different perspective on the debate about the comparatively low homeownership rate in Germany and its implications for wealth inequality (Albers et al., 2022). Previous research argued that comparatively strict regulations regarding mortgage access and down payments hampered wealth accumulation for lower-income households (Dustmann et al., 2022). With rising income inequality and intensifying status competition low-income households had to take on increasing financial burdens to participate in the highly status-relevant market for owner-occupied housing, which 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, particularly against the backdrop of research that highlights the role saving rate inequality for wealth distribution (Saez and Zucman, 2016). Pushing for deregulation of housing markets or otherwise incentivising housing wealth accumulation would further increase the pressure on low-income households to take on continuously larger financial risks, as developments towards more homeownership are not accompanied by corresponding income developments. Promoting homeownership for lower income households thus falls short in addressing the soaring wealth inequality in Germany. Instead, in an environment characterised by substantial income inequality a tightly regulated rental market and a large social housing sector might be a preferable solution to avoid widespread status externalities in housing consumption.

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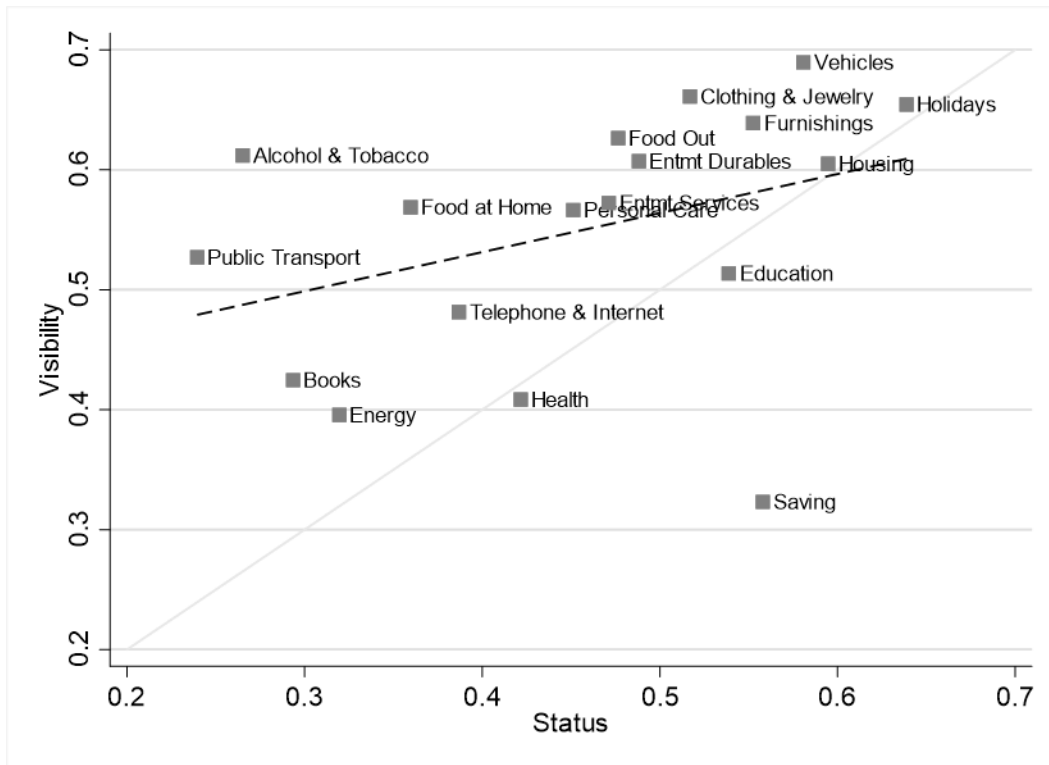


Figure 1 – Plot of Visibility and Status Relevance

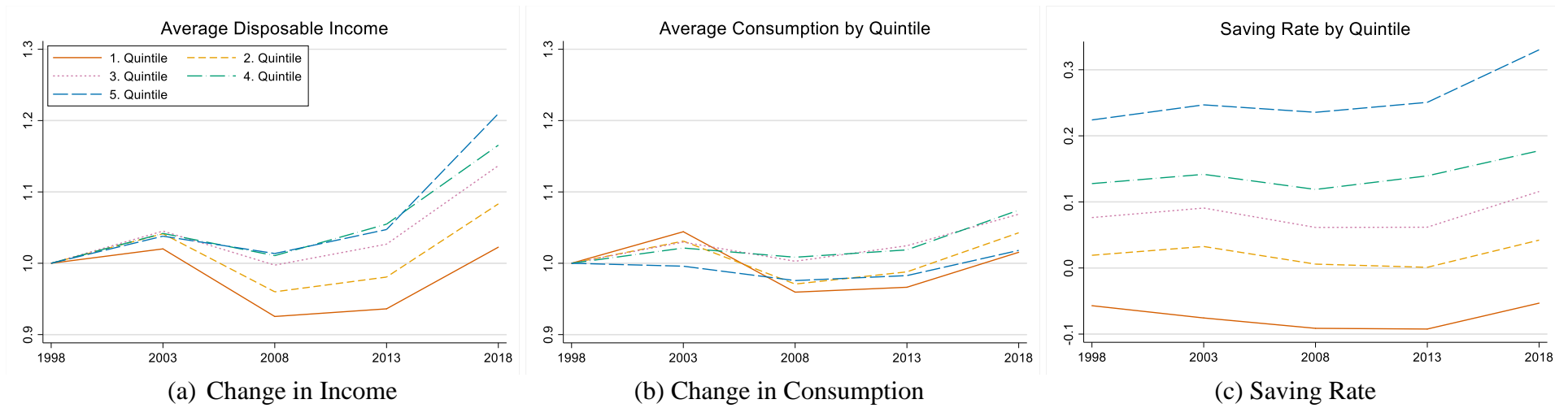


Figure 2 - Disposable Income, Consumption and Saving Rates by Quintile

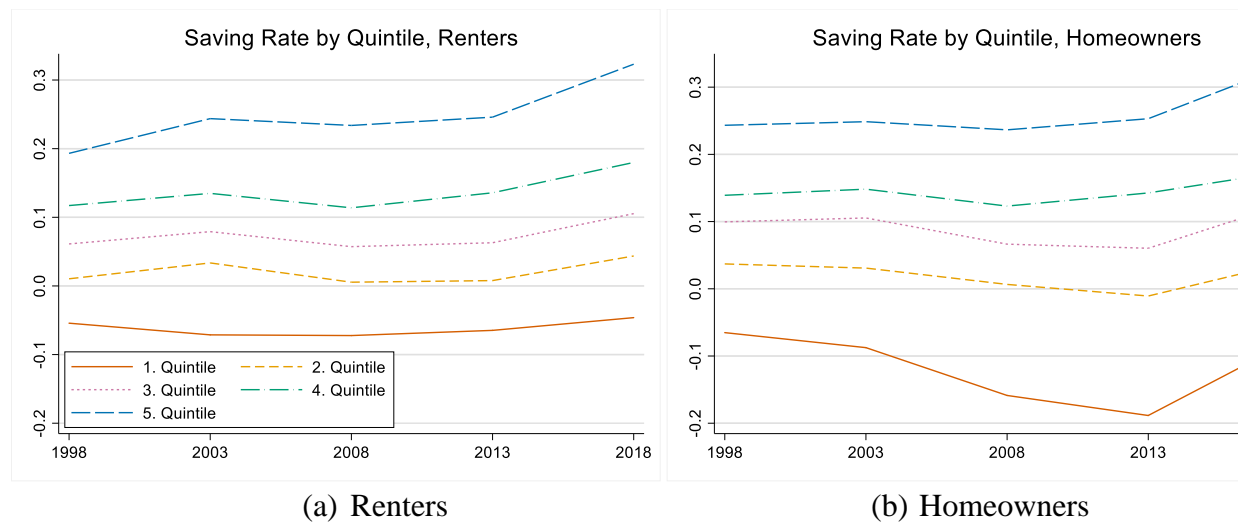


Figure 3 - Saving Rates by Quintile for Homeowners and Renters

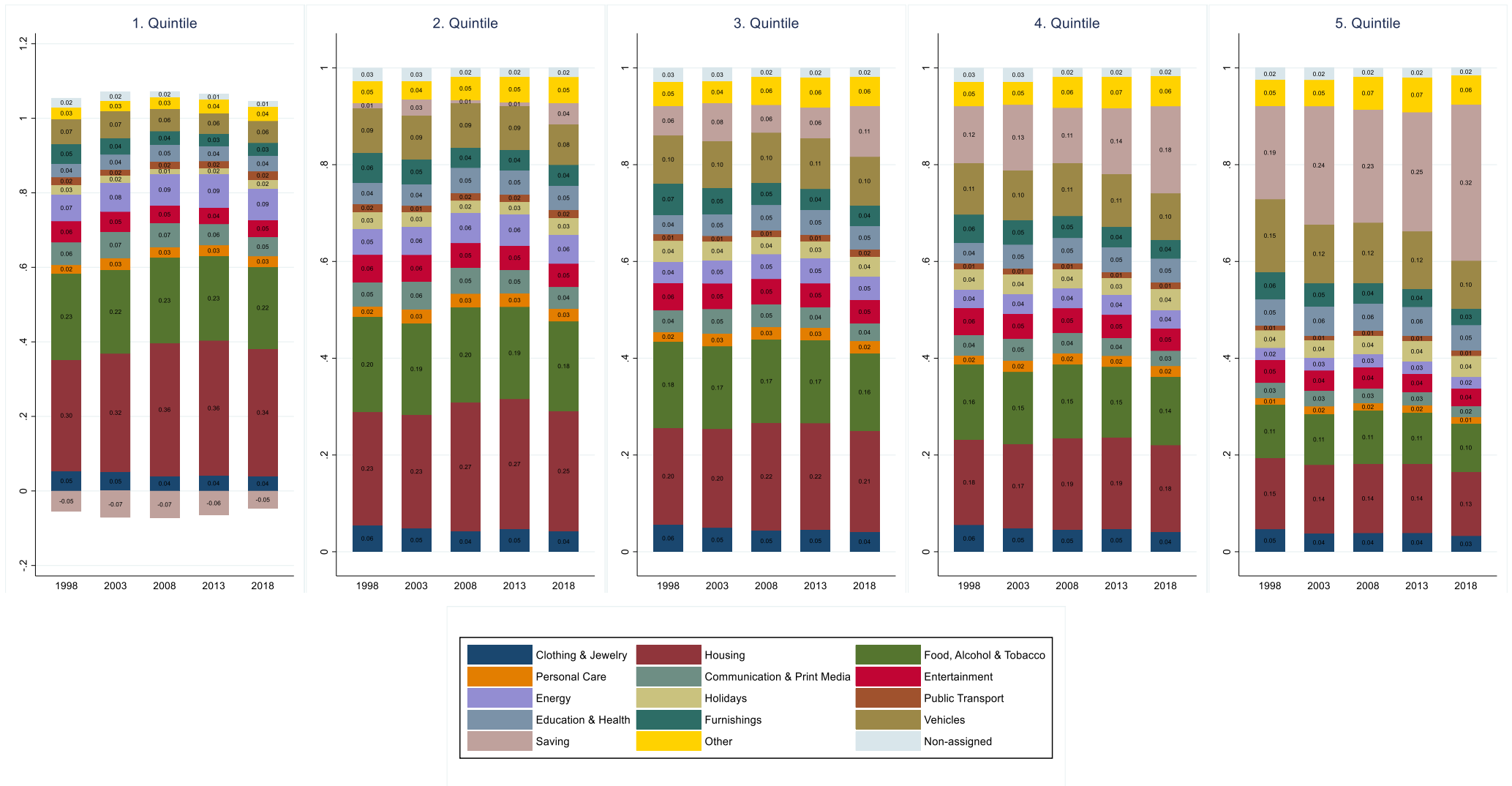


Figure 4(a) – Income Allocations of Renters

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

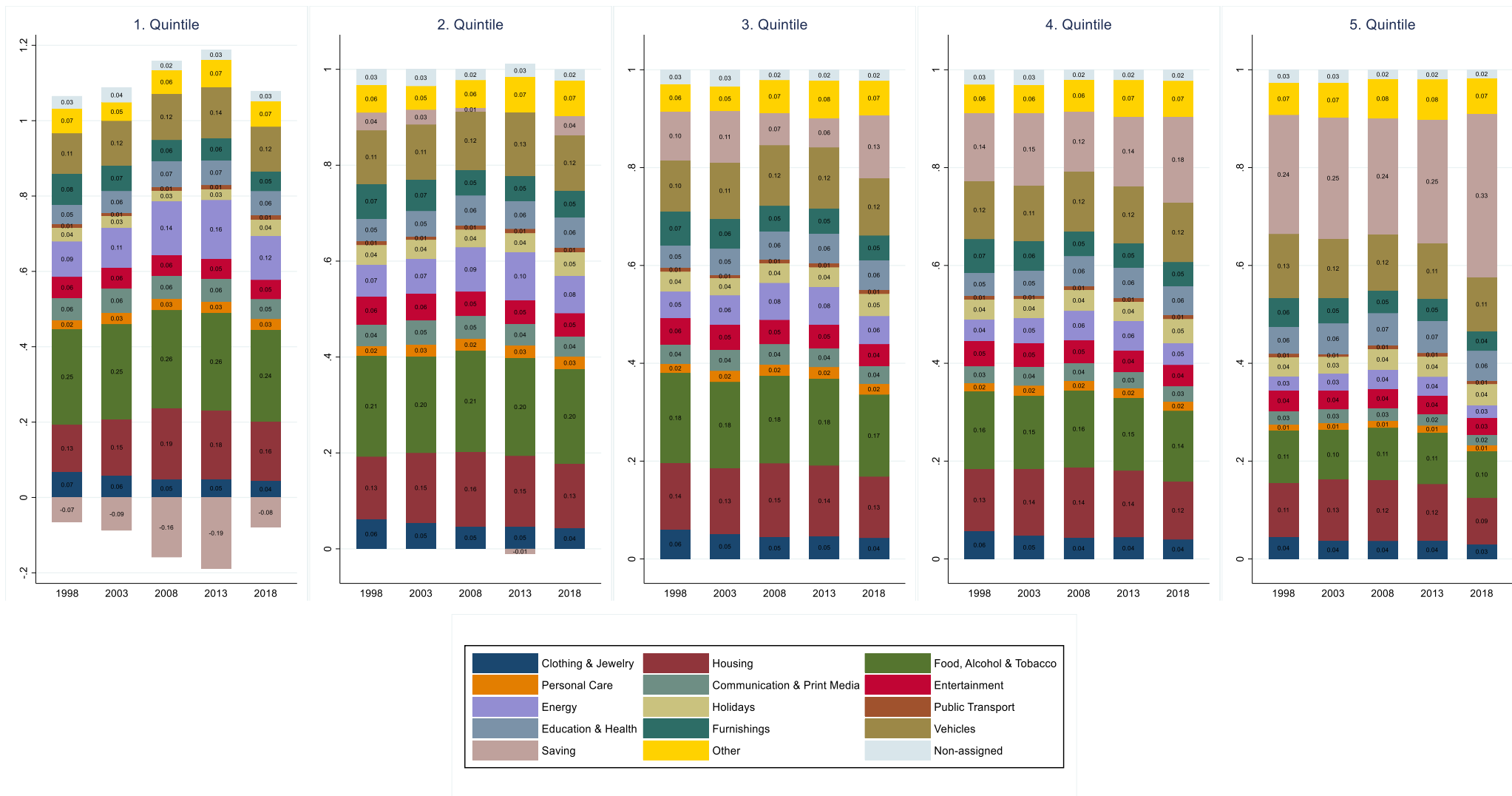


Figure 4(b) – Income Allocations of Homeowners

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

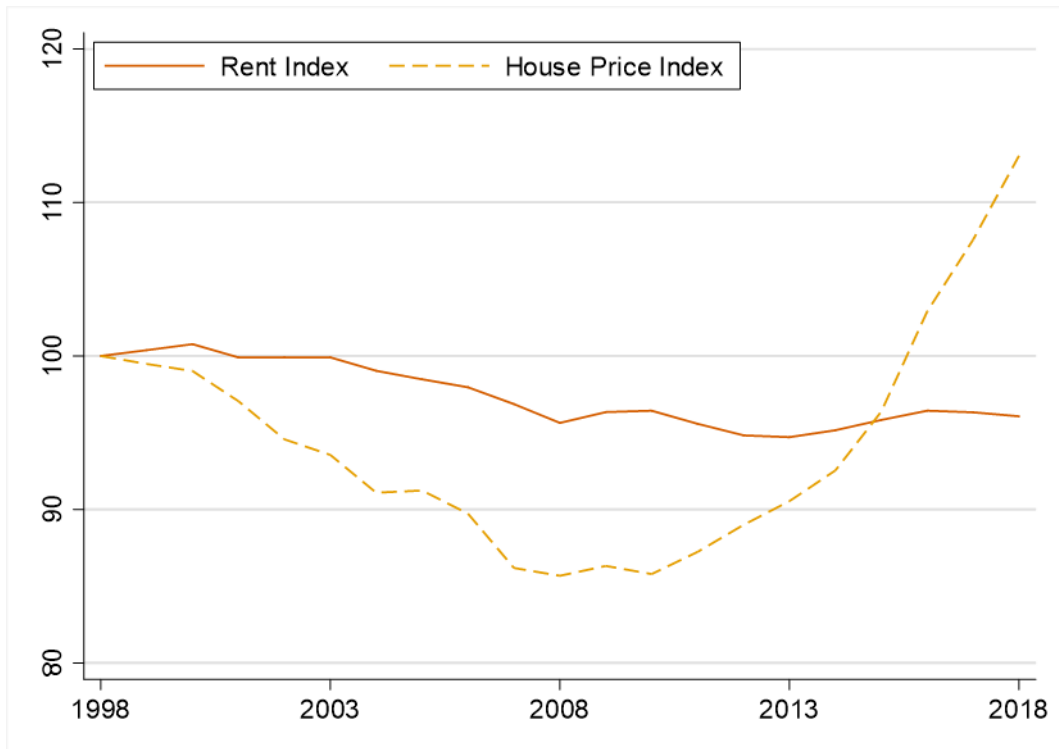
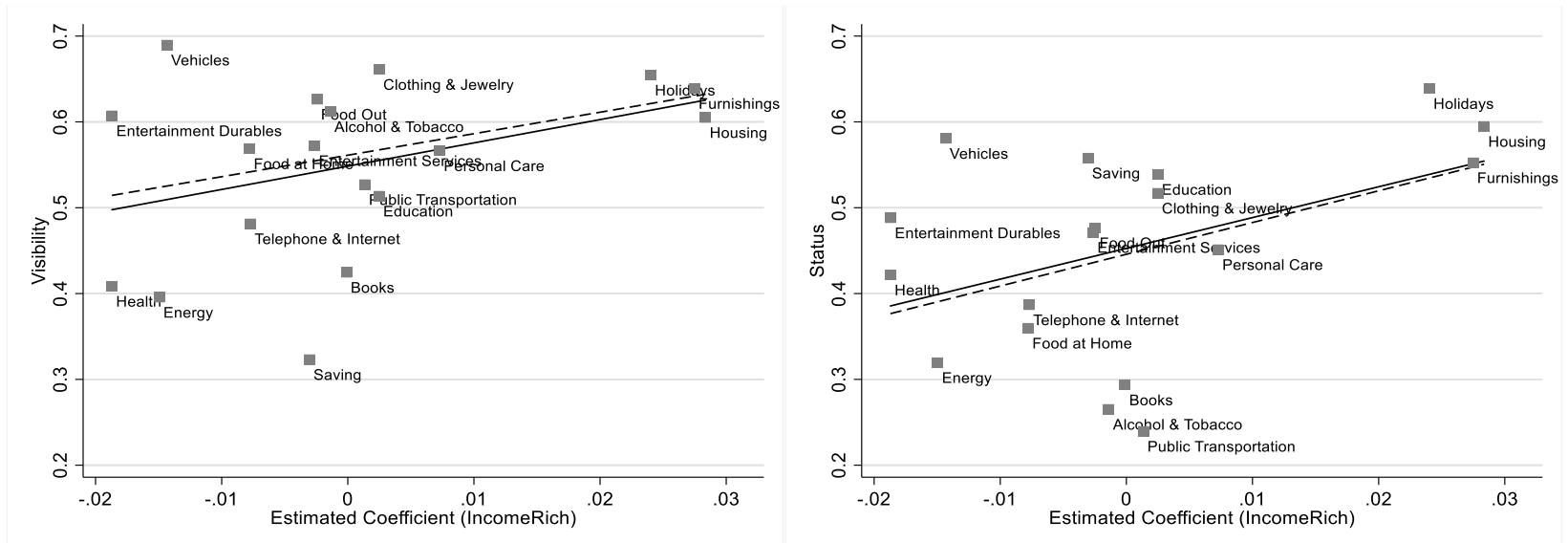
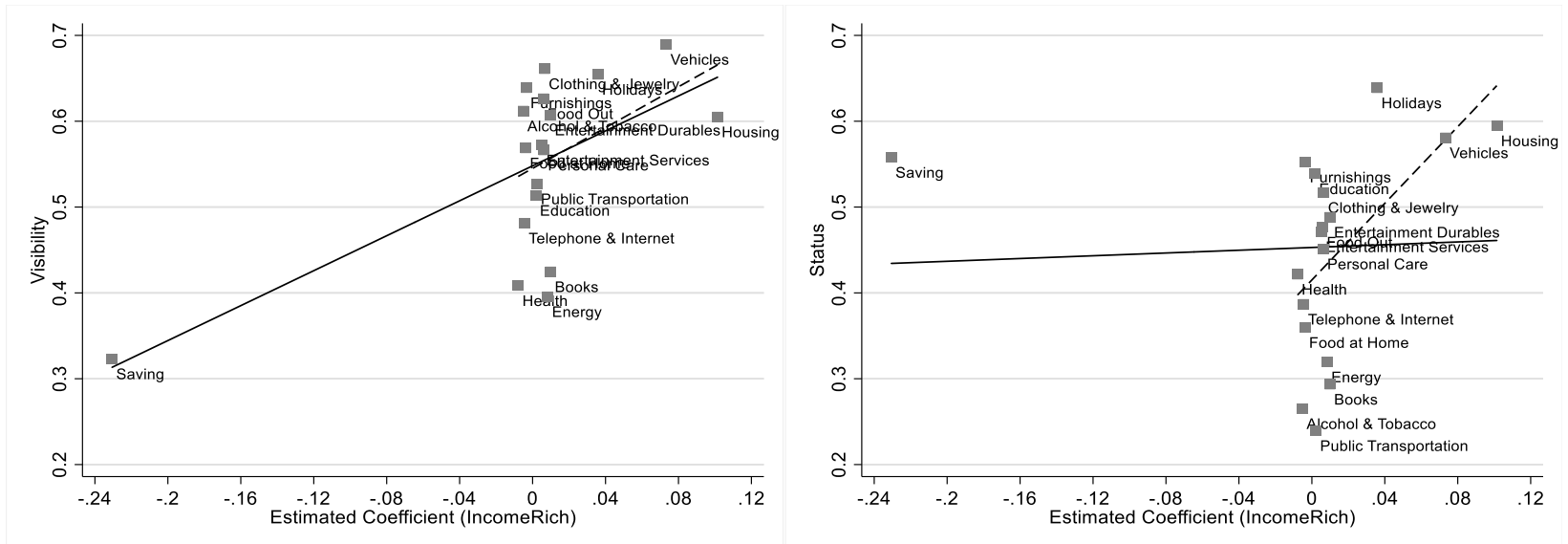


Figure 5 – Real Rent Index and Real House Price Index (1998=100)

Notes: Data source: OECD Analytical house price indicators, retrieved from https://stats.oecd.org/Index.aspx?DataSetCode=HOUSE_PRICES.



(a) Renters



(b) Homeowners

Figure 6 – Visibility and Status Relevance against Estimated Coefficient by Consumption Category

Table 1 - Visibility and Status Indices

(1)	(2)	(3)	(4)
Category	Category Name	Visibility	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	Books	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

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

<i>Dependent Variable</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Total Consumption/Income							
Sample:	x<80th		x<80th, Renters			x<80th, Homeowners		
Log(80thPercentileIncome)	0.112*** [0.033]		0.092*** [0.026]	0.104*** [0.022]	0.013 [0.025]	0.018 [0.026]	0.270*** [0.075]	0.284*** [0.069]
Log(90thPercentileIncome)		0.123** [0.040]						
Unemployment Rate				-0.402** [0.175]		-0.170 [0.215]		-0.575 [0.394]
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	155,574	155,574	155,574	155,574	88,941	88,941	66,633	66,633
R ²	0.116	0.116	0.116	0.116	0.134	0.134	0.099	0.099

Data source: EVS, 1998 to 2018. 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. We control for household characteristics, state and year fixed effects in all regressions. Log(80th/90thPercentileIncome) is the logarithm of the average income at the 80th/90th percentile of the state-year income distribution. Unemployment rate is the state unemployment rate in the respective year.

Table 3 – Quintile Heterogeneity

<i>Dependent Variable</i>	Total Consumption/Income			
	(1)	(2)	(3)	(4)
	x<80th, Renters		x<80th, Homeowners	
Log(80thPercentileIncome)	0.026	0.039	0.250***	0.363**
	[0.028]	[0.034]	[0.073]	[0.120]
Log(80thPercentileIncome)*Q2		0.009		-0.092
		[0.018]		[0.076]
Log(80thPercentileIncome)*Q3		-0.026		-0.132
		[0.031]		[0.089]
Log(80thPercentileIncome)*Q4		-0.067		-0.170**
		[0.046]		[0.076]
Unemployment Rate	-0.167	-0.172	-0.570	-0.586
	[0.211]	[0.213]	[0.390]	[0.391]
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	88,941	88,941	66,633	66,633
R ²	0.134	0.134	0.100	0.100

Data source: EVS, 1998 to 2018. 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. We control for household characteristics, state and year fixed effects in all regressions. Log(80thPercentileIncome) is the logarithm of the average income at the 80th percentile of the state-year income distribution. Unemployment rate is the state unemployment rate in the respective year. Q2, Q3, and Q4 indicate whether a household ranks in the second, third or fourth quintile of the state-year income distribution.

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

<i>Dependent Variable</i>	Total Consumption/Income					
	(1)	(2)	(3)	(4)	(5)	(6)
	Status	Other	Saving	Status	Other	Saving
	x<80th, Renters			x<80th, Homeowners		
Log(80thPercentileIncome)	0.037	-0.035***	-0.002	0.222***	0.019	-0.241***
	[0.027]	[0.011]	[0.031]	[0.052]	[0.029]	[0.063]
Unemployment Rate	0.198	-0.394***	0.195	-0.577**	0.088	0.489
	[0.259]	[0.106]	[0.214]	[0.251]	[0.217]	[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
Observations	88,941	88,941	88,941	66,633	66,633	66,633
R ²	0.060	0.084	0.109	0.021	0.171	0.092

Data source: EVS, 1998 to 2018. 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. We control for household characteristics, state and year fixed effects in all regressions. Log(80thPercentileIncome) is the logarithm of the average income at the 80th percentile of the state-year income distribution. Unemployment rate is the state unemployment rate in the respective year.

Appendix A:

Table A1 - Expenditure Categories

(1) Cate- gory	(2) Category Name	(3) Category Description
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	hairdressers and other personal care services; appliances and consumables for personal care
7	Telephone & Internet	phone & internet services; phone purchases
8	Books	books & brochures, newspapers, magazines, and stationary supplies
9	Entertainment Services	entry fees for sports and recreational events, cultural events, and institutions, etc; broadcasting 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 services
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	

Table A2 - Rich Consumption and Non-Rich Consumption

<i>Dependent Variable</i>	(1)	(2)	(3)	(4)
	First Stage	Second Stage IV		
	Log (Consumption Rich)	Total Consumption/Income		
Sample:	x<80th	x<80th, Renters	x<80th, Home- owners	
Log(80thPercentileIncome)	0.536*** [0.118]			
IV Log(ConsumptionRich)		0.195*** [0.041]	0.037 [0.055]	0.460*** [0.077]
Unemployment Rate	-0.171 [0.376]	-0.368*** [0.141]	-0.164 [0.195]	-0.492 [0.452]
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	155,574	155,574	88,941	66,633
R ²	0.976	0.116	0.134	0.099

Data source: EVS, 1998 to 2018. The sample in column 1 consists of households above the 80th percentile in the state-year income distribution. In columns 2 to 4, 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 Log(Consumption). 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). We control for household characteristics, state and year fixed effects in all regressions. Log(80thPercentileIncome) is the logarithm of the average income at the 80th percentile of the state-year income distribution. Unemployment rate is the state unemployment rate in the respective year.

Table A3 - Income of the Rich and Non-Rich Expenditures by Category

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A: Renters	Clothing & Jewellery	Housing	Food at Home	Food Out	Alcohol & Tobacco	Personal Care	Telephone & Internet	Books	Entmt. Services
<u>Dependent Variable: Household Category Consumption/Disposable Income</u>									
Log(80thPercentileIncome)	0.002 [0.006]	0.028* [0.013]	-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]
<u>Dependent Variable: Household Category Consumption/Total Consumption</u>									
Log(80thPercentileIncome)	0.004 [0.008]	0.031** [0.013]	-0.015 [0.008]	-0.001 [0.004]	-0.002 [0.003]	0.007 [0.004]	-0.009*** [0.003]	0 [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
<u>Dependent Variable: Household Category Consumption/Disposable Income</u>									
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]	-0.019** [0.007]	-0.014 [0.017]	-0.003 [0.033]
<u>Dependent Variable: Household Category Consumption/Total Consumption</u>									
Log(80thPercentileIncome)	-0.017** [0.006]	0.022*** [0.006]	0.005 [0.004]	0 [0.004]	-0.023*** [0.006]	0.019* [0.009]	-0.016** [0.006]	-0.016 [0.012]	

Data source: EVS, 1998 to 2018. Each cell contains the result from a separate regression for each of our four demand systems. 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 and state-specific prices in all regressions. Log(80thPercentileIncome) is the logarithm of the average income at the 80th percentile of the state-year income distribution.

Table A3 - Continued

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel B: Homeowners	Clothing & Jewellery	Housing	Food at Home	Food Out	Alcohol & Tobacco	Personal Care	Telephone & Internet	Books	Entmt. Services
<u>Dependent Variable: Household Category Consumption/Disposable Income</u>									
Log(80thPercentileIncome)	0.007 [0.008]	0.101*** [0.020]	-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]
<u>Dependent Variable: Household Category Consumption/Total Consumption</u>									
Log(80thPercentileIncome)	-0.007 [0.008]	0.062*** [0.015]	-0.007 [0.015]	-0.010* [0.005]	-0.005 [0.007]	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	Entmt. Durables	Vehicles	Saving
<u>Dependent Variable: Household Category Consumption/Disposable Income</u>									
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]	-0.231*** [0.060]
<u>Dependent Variable: Household Category Consumption/Total Consumption</u>									
Log(80thPercentileIncome)	-0.012 [0.015]	0.018 [0.013]	-0.001 [0.004]	-0.002 [0.003]	-0.036*** [0.003]	-0.014 [0.016]	0.001 [0.006]	0.029 [0.018]	

Data source: EVS, 1998 to 2018. Each cell contains the result from a separate regression for each of our four demand systems. 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 and state-specific prices in all regressions. Log(80thPercentileIncome) is the logarithm of the average income at the 80th percentile of the state-year income distribution.

Table A4 - Expenditure Responses against Visibility or Status Relevance

<i>Dependent Variable</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Estimated expenditure responses							
	Sample:	x<80th, Renters				x<80th, Homeowners		
	All categories		Excl. Saving		All categories		Excl. Saving	
Visibility	0.051 [0.032]		0.066 [0.038]		0.388*** [0.120]		0.127 [0.078]	
Status Relevance		0.051* [0.027]		0.055* [0.028]		0.023 [0.135]		0.135** [0.053]
Constant	-0.028 [0.018]	-0.023* [0.013]	-0.037 [0.022]	-0.024* [0.013]	-0.212*** [0.067]	-0.010 [0.063]	-0.057 [0.044]	-0.046* [0.025]
Observations	18	18	17	17	18	18	17	17
R ²	0.138	0.184	0.165	0.204	0.395	0.002	0.151	0.302

Data source: Estimated coefficients from table A3 and indices from table 1. 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 A3. Visibility and Status Relevance are the indice values of the respective categories reported in table 1. Results reflect the fit of regression lines in figure 6.

Table A5 - Top Income Levels and Non-Rich Income Satisfaction

<i>Dependent Variable</i>	(1)	(2)	(3)	(4)	(5)	(6)
	Satisfaction with household income					
	Sample:	x<80th				
Log(80thPercentileIncome)	-0.922 [0.639]	-0.990** [0.350]	-0.982*** [0.312]	-1.158 [0.740]	-1.225*** [0.333]	-1.218*** [0.299]
Log(80thPercentileIncome)*Q2				-0.094 [0.328]	-0.108 [0.321]	-0.108 [0.321]
Log(80thPercentileIncome)*Q3				0.227 [0.384]	0.204 [0.369]	0.208 [0.368]
Log(80thPercentileIncome)*Q4				0.720* [0.330]	0.713** [0.322]	0.716** [0.323]
Unemployment Rate			-2.506 [1.525]			-2.510 [1.503]
State and year FEs	Yes	Yes	Yes	Yes	Yes	Yes
State-specific time trends	No	Yes	Yes	No	Yes	Yes
Household income FEs	Yes	Yes	Yes	Yes	Yes	Yes
Household controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	308,249	308,249	308,249	308,249	308,249	308,249
R ²	0.204	0.205	0.205	0.205	0.206	0.206

Data source: SOEPv36, 1998 to 2018. 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 individuals satisfaction with their household income. We control for individual characteristics, household characteristics, state and year fixed effects in all regressions. Log(80thPercentileIncome) is the logarithm of the average income at the 80th percentile of the state-year income distribution. Unemployment rate is the state unemployment rate in the respective year. 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.

Table A6 - Income of the Rich and Non-Rich Housing Consumption

<i>Dependent Variable</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Housing Consumption/Income						
	Sample:	x<80th		x<80th, Renters		x<80th, Homeowners	
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	132,301	132,301	131,579	87,837	87,367	44,464	44,212
R ²	0.318	0.318	0.323	0.397	0.413	0.106	0.108

Data source: SOEPv36, 2000 to 2014. 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. We control for household characteristics, state and year fixed effects in all regressions. Log(80thPercentileIncome) is the logarithm of the average income at the 80th percentile of the state-year income distribution. Unemployment rate is the state unemployment rate in the respective year. House Tenure is the number of years a household has lived in their current residence.

Table A7 - Home Equity Channel

<i>Dependent Variable</i>	(1)	(2)	(3)	(4)
	Total Consumption/Income			
Sample:	x<80th, Homeowners			
Log(80thPercentileIncome)	0.256** [0.089]		0.273*** [0.078]	0.288*** [0.072]
Log(90thPercentileIncome)		0.289*** [0.082]		
Log(RealEstateWealth)	0.001 [0.001]	0.001 [0.001]	0.001* [0.001]	0.001* [0.001]
Unemployment Rate				-0.601 [0.395]
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	66,633	66,633	66,633	66,633
R ²	0.099	0.099	0.099	0.099

Data source: EVS, 1998 to 2018. The sample consists of household-year observations below the 80th percentile in the state-year income distribution. The sample is restricted to homeowners. The dependent variable is defined as total household consumption over income for a given EVS household in a given state and year. We control for household characteristics, state and year fixed effects in all regressions. Log(80th/90thPercentileIncome) is the logarithm of the average income at the 80th/90th percentile of the state-year income distribution. Unemployment rate is the state unemployment rate in the respective year. Log(RealEstateWealth) is the logarithm of total real estate wealth of a given household in a given year.

Table A8 - Local Price Channel

<i>Dependent Variable</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Log(Local CPI)				Total Consumption/Income					
Sample:	State-Year Panel SOEP		State-Year Panel EVS		x<80th		x<80th, Renters		x<80th, Homeowners	
Log(80thPercentileIncome)	-0.013*		0.009		0.096***	0.103***	0.016	0.019	0.262***	0.273***
	[0.008]		[0.016]		[0.020]	[0.018]	[0.028]	[0.029]	[0.072]	[0.065]
Log(90thPercentileIncome)		-0.006		0.011						
		[0.006]		[0.016]						
Log(LocalCPI)					0.708**	0.443	0.448	0.331	0.724	0.473
					[0.321]	[0.280]	[0.483]	[0.442]	[0.766]	[0.882]
Unemployment Rate	-0.274***	-0.272***	-0.300***	-0.301***		-0.317*		-0.130		-0.466
	[0.032]	[0.032]	[0.076]	[0.075]		[0.145]		[0.173]		[0.447]
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	147,237	147,237	83,779	83,779	63,458	63,458
R ²	0.999	0.999	0.999	0.999	0.114	0.114	0.132	0.132	0.098	0.098

Data source: EVS and SOEPv36, 1998 to 2018. 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. We control for household characteristics, state and year fixed effects in all regressions. Log(80th/90thPercentileIncome) is the logarithm of the average income at the 80th/90th percentile of the state-year income distribution. Unemployment rate is the state unemployment rate in the respective year. Log(LocalCPI) is the logarithm of the state-level CPI.

Table A9 - Income of the Rich and Future Income for the Non-Rich

<i>Dependent Variable</i>	(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+4		Log(Avg. HH income) between t+1 and t+2		Log(Avg. HH income) between t+1 and t+4		S.D. of Log(HH income) t+1 to t+4	
Sample:	x<80th, Homeowners											
Panel A												
Log(HH income)	0.717***	0.717***	0.667***	0.667***	0.599***	0.599***	0.674***	0.674***	0.627***	0.626***	-0.071***	-0.071***
	[0.012]	[0.012]	[0.010]	[0.010]	[0.014]	[0.014]	[0.012]	[0.012]	[0.015]	[0.015]	[0.011]	[0.011]
Log(80thPercentileIncome)	-0.012	-0.073	-0.008	-0.099	-0.025	-0.138	-0.014	-0.100	-0.047	-0.148*	-0.044	-0.028
	[0.049]	[0.070]	[0.064]	[0.073]	[0.089]	[0.094]	[0.053]	[0.058]	[0.077]	[0.082]	[0.043]	[0.046]
State-specific time trends	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	64,667	64,667	56,773	56,773	43,365	43,365	55,932	55,932	41,911	41,911	41,911	41,911
R-squared	0.653	0.653	0.597	0.597	0.533	0.533	0.704	0.704	0.701	0.701	0.044	0.046
Panel B												
Log(HH income)	0.717***	0.717***	0.667***	0.667***	0.599***	0.599***	0.674***	0.674***	0.627***	0.626***	-0.071***	-0.071***
	[0.012]	[0.012]	[0.010]	[0.010]	[0.014]	[0.014]	[0.012]	[0.012]	[0.015]	[0.015]	[0.011]	[0.011]
Log(90thPercentileIncome)	-0.016	-0.052	-0.093**	-0.183**	0.001	-0.064	-0.069**	-0.136***	-0.073*	-0.133***	-0.039	-0.032
	[0.027]	[0.031]	[0.037]	[0.062]	[0.051]	[0.055]	[0.026]	[0.043]	[0.037]	[0.035]	[0.030]	[0.033]
State-specific time trends	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	64,667	64,667	56,773	56,773	43,365	43,365	55,932	55,932	41,911	41,911	41,911	41,911
R-squared	0.653	0.653	0.597	0.597	0.533	0.533	0.704	0.704	0.701	0.701	0.044	0.046

Data source: SOEPv36, 1998 to 2018. The sample consists of household-year observations of homeowners below the 80th percentile in the state-year income distribution. The sample is restricted to homeowners. 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. Log(80th/90thPercentileIncome) is the logarithm of the average income at the 80th/90th percentile of the state-year income distribution.

Table A10 - Top Income Levels and Sentiments of the Non-Rich

<i>Dependent Variable</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Worried about household finances				Worried about economic development			
Log(80thPercentileIncome)	0.149 [0.131]	-0.039 [0.128]			0.063 [0.122]	-0.005 [0.118]		
Log(90thPercentileIncome)			0.129 [0.110]	-0.015 [0.104]			0.098 [0.098]	0.110 [0.090]
State and year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State-specific time trends	No	Yes	No	Yes	No	Yes	No	Yes
Household income FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	125,196	125,196	125,196	125,196	124,434	124,434	124,434	124,434
R ²	0.154	0.155	0.154	0.155	0.138	0.140	0.138	0.140

Data source: SOEPv36, 1998 to 2018. 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 individuals 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. Log(80th/90thPercentileIncome) is the logarithm of the average income at the 80th/90th percentile of the state-year income distribution.

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€ (2003 to 2018 waves) or 35,000 Deutschmarks (or 17,896€; 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. (2020) 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, state of residence, highest educational attainment, employment status, marital status, homeowner status, net household income and number of adults and children living in their household. In table B1 we show the summary statistics for the two subsamples, as well as results from tests for the equality of means across the subsamples. We do not find a statistically significant difference in means for any of the recorded sociodemographic characteristics, except for a small difference in the share of individuals with a high-school diploma. 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.

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

- Becker, I., Frick, J. R., Grabka, M. M., Hauser, R., Krause, P., & Wagner, G. G. (2003). A comparison of the main household income surveys for Germany: EVS and SOEP. In *Reporting on Income Distribution and Poverty: Perspectives from a German and a European Point of View* (pp. 55-90). Springer Berlin Heidelberg.
- Becker, I. (2014). EVS und SOEP: methodische Aspekte bei Verteilungsanalysen, *soeb-Working-Paper*, 2014-3.

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

Variable	Sample:	Visibility Question			Status Relevance Question			t-test for Equality of Means	
		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
Net household income		936	3428.84	3687.12	912	3256.90	1941.16	1.25	0.21
Number of adults in household		915	1.88	0.71	887	1.91	0.77	-0.86	0.39
Number of children in household		915	0.43	0.82	887	0.42	0.82	0.37	0.71
Household owns primary residence		922	0.41	0.49	892	0.42	0.49	-0.31	0.76
High-school diploma		936	0.45	0.50	912	0.53	0.50	-3.26	0.00
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

Table B2 - Expenditure Categories

(1) Category	(2) Category Name	(3) 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	Mobiltelefon, Telefon und Internet
8	Books	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)