Gambling to Leapfrog in Status?

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Abstract

This paper shows that households with positional concerns and convex status utility use gambling to attempt leapfrogging in the social hierarchy. We test this theoretical prediction relying on household data that is representative for Germany, proxying the status orientation of households by their expenditures for conspicuous consumption. Our empirical results strongly indicate that households who care about status are more likely to participate in gambling and invest more in gambling, while they save less.

Keywords: conspicuous consumption, status, relative income, gambling, behavioral economics

JEL: D12, D14, D62

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1 Introduction

1.1 Motivation and main results

The idea that relative positions in society influence well-being and behavior has taken a stronghold in economics. People compare themselves to others in a wide variety of aspects of life, with important repercussions on happiness. For instance, Dohmen et al. (2011) provide evidence for the importance of relative income for subjective well-being using functional magnetic resonance imaging (fMRI). Further empirical evidence for the importance of relative income positions for individual happiness and actions can be found in Stutzer (2004) and Frey et al. (2008), for instance. For individuals who care very much about status but who have limited access to the legitimate means for attaining the goal of economic success such as an elite education, a pressure arises that necessitates coping behavior. We argue that gambling is a means of coping with the discrepancy between the desired status and the bleak prospects of achieving it via traditional channels.[1] Despite the extremely low probability of winning and the low pay-out ratio (for example, Haisley et al. 2008 report that people received only 53 cents in return for every dollar spent on lottery tickets over the years 1964-2003 in the US), gambling offers an unparalleled possibility to leapfrog in the status hierarchy.

This paper explores whether households who attach greater importance to their relative position are more likely to gamble and to spend more on gambling activities. We use a data set that is representative for Germany and comprises household characteristics, a detailed breakdown of household expenditures, and information about household income. A reasonable measure for the importance attached to status considerations is thus central to our endeavor but is usually difficult to obtain in the field. In this paper, we make use of households' expenditures for conspicuous consumption as a proxy for status preferences. Conspicuous consumption (Veblen 1899) refers to consumption that aims to reveal one's economic status to others. To establish one's economic status relative to others, consumption is often used as a signal (see, e.g., Corneo and Jeanne 1998, Heffetz 2011). This is due to the

fact that many consumption choices are easily observable by others, whereas aspects such as financial wealth are not readily observed. Both the fact that relative concerns are important and that goods differ with regard to their positionality (i.e. that certain goods have a higher relevance for relative standing in society) have been confirmed in several empirical studies, among them Alpizar et al. (2005), Carlsson et al. (2007), Hillesheim and Mechtel (2013), Solnick and Hemenway (1998, 2005). Cars are usually considered as a prime example of a positional good. Along these lines, Winkelmann (2012) establishes for Switzerland that the prevalence of luxury cars in one's own municipality decreases income satisfaction, and Kuhn et al. (2010) find that neighbors of people who won a car in the lottery have significantly higher levels of car consumption than others. Using expenditures for conspicuous consumption as a proxy for the strength of households' positional concerns, we find that a strong status orientation indeed makes participation in gambling and a higher extent of involvement more likely. This supports the hypothesis that many status-oriented individuals seek opportunities to "correct" their low status and find one in gambling. In contrast, traditional saving, which may be an alternative way of improving one's absolute (although not necessarily relative) standing in the future, is less important for households with strong status concerns.

The paper at hand contributes in several ways to existing knowledge. First, we document that status orientation is an important motive for taking part in gambling. This finding is of importance, given that no definite answer has yet been found to explain why people play lotteries, although several attempts have been made (see Ariyabuddhiphongs 2011 for a recent survey). Even though we do not consider the motivation described in this paper to be all-encompassing, it certainly is a valuable addition to the existing theories. Second, we contribute to the literature about the repercussions of individuals having positional concerns. Given that gambling has a negative expected payoff, taking part in it lowers the economic status of those trying to leapfrog in the hierarchy by its utilization in expectation. Moreover, people with strong status considerations seem to substitute gambling for traditional wealth

formation. This adds to the adverse consequences already established in the literature. For example, Moav and Neeman (2010, 2012) show that conspicuous consumption may influence the likelihood of poverty traps, and Frank (2000, 2008) argues that conspicuous consumption may use up resources otherwise spent for healthcare, among other things.

1.2   Relation to the literature

Our paper is most closely related to Haisley et al. (2008) who conducted two experiments dealing with subjective relative income and lottery ticket purchases. Subjects were asked to complete surveys, then handed five dollar bills for doing so, and afterwards were offered lottery tickets in exchange for the five dollars received. In Experiment 1, respondents had to check the applicable income bracket for their yearly income while completing the survey. The brackets were manipulated in a way so as to make some subjects perceive that they were earning very little income. These subjects subsequently purchased a higher number of tickets on average. The second experiment tested whether or not the suggestion that middle-class and rich people often have better access to aspects related to success would motivate low-income people to opt more often for the supposedly class-free lottery. The results are again in support of the hypothesis. Our study is complementary to Haisley et al. (2008). Our analysis builds on actual consumption patterns observed for a substantial number of individuals at several points in time. At the same time, the underlying behavioral model is closely related. Our results suggest that many individuals feel pressure given that the desired status will in all likelihood remain out of reach, and that these subjects consider gambling as probably the only legitimate channel that promises "correction" and is similarly accessible to low-status households.

The prior empirical literature on lottery play has largely been concerned with the question about its potential regressivity (see, e.g., Beckert and Lutter 2009, Clotfelter and Cook 1987, Crowley et al. 2012, Farrell and Walker 1999, Perez and Humphreys 2011, Worthington 2001). In contrast, Kearney (2005) explores whether households substitute lottery expendi-

tures for other gambling expenditures when a state lottery becomes available, and whether households respond to changes of the lottery's expected value. Our findings support the previous studies in that the income elasticity of expenditures on gambling is strictly less than one in all of our empirical models. It is important to note that our key explanatory variable that reflects the importance of positional concerns is a significant predictor even though we simultaneously include the level of income as an explanatory variable. In other words, our results are distinct from simply stating that poorer households find gambling more appealing. Even among middle-class households, for example, we can explain differential engagement in gambling by reference to the importance attached to status.

When testing for the explanatory power of status orientation, we seek to control for socio-economic and demographic determinants of gambling and thereby also consider the influence of the region, urbanization, education, and gender, yielding a host of findings *secondary* to our result on the effect of the importance attached to relative position. We thereby contribute to the evolving literature on gender effects (see, e.g., Andreoni and Vesterlund 2001, Croson and Gneezy 2007) and comparisons between East and West German households (e.g., Alesina and Fuchs-Schündeln 2007, Brosig et al. 2011, Friehe and Mechtel forthcoming, Heineck and Süssmuth forthcoming, Ockenfels and Weimann 1999, Rainer and Siedler 2009, Torgler 2003). Our regression results suggest that women are much less interested in gambling. One possible interpretation may be that our approximation of status concerns does not capture all of the possible gender differences, and that women are less concerned about relative position. However, the findings on the effect of gender on the strength of positional concerns hitherto are ambiguous (Alpizar et al. 2005, Corazzini et al. 2012, Dohmen et al. 2011, Friehe and Mechtel forthcoming, and Pingle and Mitchell 2002). Many other empirical studies of gambling have established gender effects similar to ours (see, e.g., Perez and Humphreys 2011), although other results can be found in the literature (see, e.g., Ariyabuddhiphongs 2011, Beckert and Lutter 2013, Crowley et al. 2012). Furthermore, we find that households in East Germany are less likely to gamble and have significantly lower

expenditures for gambling. The fact that gambling was possible in both parts of Germany before the reunification excludes this possibility as a simple explanation for the observed difference. Instead, our finding may be related to the fact that East Germans tend to believe that wealth and success in life are not as much determined by luck (see Alesina and Fuchs-Schündeln 2007) and believe in the importance of hard work (Corneo 2001). Part of the explanation of the observed difference possibly rests with the different regime experiences of East and West German households. Finally, regarding education, we obtain the finding that better educated subjects seem to engage less in gambling, a result that is well-aligned with the empirical literature on gambling (see, e.g., Beckert and Lutter 2009, 2013).

The remainder of our paper is organized as follows. In Section 2, we present a simple theoretical model to derive our central hypothesis regarding the influence of a greater status orientation on the involvement in lottery. We describe the data used for our analysis in Section 3, while Section 4 contains our empirical analysis. The last section concludes.

2 Theoretical model

In this section, we describe a simple model of consumer decision-making.[2] The comparative-statics analysis will deliver the result that greater importance attached to the relative position makes more investment in the lottery optimal when status utility is sufficiently convex.

Consider a representative household with preferences for consumption and relative standing. We assume that well-being can be represented by the following utility function:

$$T = u(x) + v(y) + gw(S), \tag{1}$$

where x and y are the household's consumption levels of the positional and the non-positional good, and S is the relative standing. The utility from consumption is increasing at a diminishing rate, that is, both $u' > 0 > u''$ and $v' > 0 > v''$ hold in addition to the assumptions $\lim_{x \to 0} u' = \infty$ and $\lim_{y \to 0} v' = \infty$. The marginal utility from an improvement in relative

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standing is positive and may in principle be either decreasing or increasing. For example, Robson (1992) assumes that utility is strictly convex in status, whereas Corneo (2002) supposes a strictly concave relationship. Our specification of T implies that we consider utility separable in consumption utility and utility from status considerations, a case between absolute consumption and relative standing being complements or substitutes. The scalar $g \geq 0$ represents the importance given to relative standing compared to absolute consumption. Relative standing is determined by comparing the individual level of absolute consumption of the status-relevant good x with the average level of absolute consumption $\bar{x}$. We follow Card et al. (2012), Falk and Knell (2004), and Konrad and Lommerud (1993), among others, and specify

$$S \equiv x - \bar{x}. \tag{2}$$

The household has fixed income I and may participate in a lottery. The lottery pays Bl in the winning state of the world (which occurs with probability $1-p$), given an investment of l in both states of the world and $B > 1$. That is, we assume for simplicity that a higher investment influences only the payout of the lottery, but not the winning probability. Lotteries usually have a negative expected payoff, $EV = (1-p)(Bl - l) - pl$. As a result, we obtain

$$EV_l = (1-p)(B-1) - p < 0. \tag{3}$$

In other words, each dollar spent in the lottery pays less than a dollar back in expected terms. In most scenarios, this is due to $(1-p)$ being small. For example, Haisley et al. (2008) report that the average expected value of a dollar spent on lottery tickets was -.47 dollars. We have to distinguish between two different levels of available income that is left for consumption expenditures, depending on whether the winning state M or the no win

state N materializes:

$$I_M = I + Bl - l \tag{4}$$

$$I_N = I - l \tag{5}$$

where $l \geq 0$ is a choice variable of the household.

The household seeks to

$$\begin{aligned}
\max_{y,l} ET = &\, p[u(I_N - y_N) + v(y_N) + gw(I_N - y_N - \bar{x})] \\
&+ (1-p)[u(I_M - y_M) + v(y_M) + gw(I - y_M - \bar{x})],
\end{aligned} \tag{6}$$

where we use $x_j = I_j - y_j$, $j = M, N$. That is, we assume that the consumption levels of the positional and non-positional good can be determined conditional on the state of the world. The first-order conditions are given by

$$ET_{y_N} = p[v'_N - u'_N - gw'_N] = 0 \tag{7}$$

$$ET_{y_M} = (1-p)[v'_M - u'_M - gw'_M] = 0 \tag{8}$$

$$ET_l = (1-p)(B-1)[u'_M + gw'_M] - p[u'_N + gw'_N] \leq 0 \tag{9}$$

$$l \times ET_l = 0 \tag{10}$$

where v'_j is a shorthand for $v'(y_j)$ and so on. The optimal consumption of y in state j levels the marginal utility and the marginal costs, where the latter is given by the reduction in the consumption of the positional good, affecting consumption and status utility.

In our empirical analysis, we are interested in the consequences of variety regarding the importance attached to relative standing. This translates into different levels of g in the present stylization. In this regard, we arrive at our first observation.

Lemma 1 *Households with little concern for status (i.e., households for which $g \to 0$ holds)*

will not participate in a lottery with negative expected value.

This follows from the fact that the household spends more on x in state M than in state N, diminishing utility with respect to the good x, and (3).

As a next step, we turn to households with a non-negligible weight g. When the household chooses to invest in the lottery, the condition $ET_l = 0$ together with (3) implies

$$\frac{(1-p)(B-1)}{p} = \frac{u'_N + gw'_N}{u'_M + gw'_M} < 1. \tag{11}$$

This in turn means that

$$0 < u'_N - u'_M < g[w'_M - w'_N] \tag{12}$$

where the left-hand side is greater than zero due to the fact that the household spends more on the positional good in the winning state of the world and that the marginal utility from consumption is diminishing. This allows us to conclude:

Lemma 2 *Households who invest in a lottery with negative expected value must have status utility that is sufficiently strictly convex.*

In other words, households who attach importance to relative standing but have concave status utility w should not participate in a lottery with a negative expected value.

Next, we present results from a comparative-statics analysis for subjects that do participate in the lottery. Our research question concerns the extent to which household investment in the lottery varies with their ambition for favorable status positions. The comparative-static properties of the model follow from. In the following, we will disregard equilibrium effects on the level of comparison consumption $\bar{x}$.

$$\begin{pmatrix} ET_{y_N y_N} & 0 & ET_{y_N l} \\ 0 & ET_{y_M y_M} & ET_{y_M l} \\ ET_{l y_N} & ET_{l y_M} & ET_{ll} \end{pmatrix} \begin{pmatrix} dy_N \\ dy_M \\ dl \end{pmatrix} = \begin{pmatrix} -ET_{y_N g} \\ -ET_{y_M g} \\ 0 \end{pmatrix} dg. \tag{13}$$

The determinant of the 3×3 matrix on the left-hand side will be denoted H in our subsequent argumentation, and is supposed to be negative by the sufficient second-order conditions.

From the first-order conditions and the assumption that the sufficient second-order conditions are fulfilled, we obtain

$$ET_{y_M y_M} = (1-p)[v_M'' - u_M'' - gw_M''] < 0 \tag{14}$$

$$ET_{y_N y_N} = p[v_N'' - u_N'' - gw_N''] < 0 \tag{15}$$

$$ET_{ll} = p[u_N'' + gw_N''] + (1-p)(B-1)^2[u_M'' + gw_M''] < 0 \tag{16}$$

$$ET_{y_N l} = p[u_N'' + gw_N''] \tag{17}$$

$$ET_{y_M l} = -(1-p)(B-1)[u_M'' + gw_M''] \tag{18}$$

$$ET_{y_N g} = -pw_N' < 0 \tag{19}$$

$$ET_{y_M g} = -(1-p)w_M' < 0. \tag{20}$$

We are interested in the expenditures for lotteries of status-oriented households, and therefore seek to interpret:

$$\frac{dl}{dg} = A\left\{(1-p)(B-1)[u_M'' + gw_M'']\frac{v_N'' - u_N'' - gw_N''}{v_M'' - u_M'' - gw_M''} - p[u_N'' + gw_N'']\frac{w_N'}{w_M'}\right\} \tag{21}$$

where $A = \{p(1-p)w_M'[v_M'' - u_M'' - gw_M'']\}\,H^{-1} > 0$.

An increase in the importance attached to relative standing implies that both the beneficial comparison in the winning state of the world and the disadvantageous comparison in the losing state of the world have a greater impact on well-being. The former comparison gets even more favorable as a consequence of a greater investment in the lottery, whereas the latter one becomes more unfavorable. We have concluded in Lemma 2 that households who invest in the lottery must have strictly convex status utility. This can be used for the interpretation of (21), because the first term in the parentheses will be positive (due to $u_M'' + gw_M'' > 0$) and the second one will go to zero for w sufficiently convex.

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Proposition 1 *Households who attach more importance to relative standing are more likely to gamble.*

Proposition 2 *Households who participate in the lottery will invest the more in the lottery, the more importance they attach to relative standing for w sufficiently convex.*

3   Data

The central testable predictions that follow from our simple theoretical model are that households with a greater emphasis on relative consumption (i) are more likely to gamble, and (ii) will spend more on gambling. We test these hypotheses using data on households' expenditures from the income and expenditure sample (*Einkommens- und Verbrauchsstichprobe, EVS*). The EVS data is provided by the German statistical office (*Statistisches Bundesamt*) and comprise the largest sample of its kind in Europe. Every five years, households voluntarily participate in the survey, provide information on socio-demographic household characteristics, and supply very detailed data on household income and expenditures, savings, durable consumer goods, and the housing situation. Thus, the scope of the EVS is similar to that of the US Consumer Expenditure Survey (that was used by Kearney 2005, for example). The resulting cross-sectional data is representative for Germany and has been used in a number of studies regarding household savings behavior and inequality (see, e.g., Börsch-Supan et al. 2001, Fuchs-Schündeln et al. 2010, Kopetsch and Rauscher 2006, Scheicher 2010), among others. For further information on the EVS, see, e.g., Statistisches Bundesamt (2005a, 2005b).

Testing our central predictions requires data on both households' expenditures on gambling activities and a measure for the strength of positional concerns. While the first kind of information is directly included in the EVS data, it is necessary to find an adequate proxy for the second kind of information. In this regard, we consider the importance of expenditures for conspicuous consumption, because conspicuous consumption can be understood –

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following Veblen (1899) – as the use of money or other resources to display a high social status to others, that is, as an activity meant to influence the individual relative position in the social hierarchy. Goods that are particularly suited to support this objective should be (i) readily observable, (ii) leave the impression that those who consume more of them are, on average, better off regarding wealth than individuals who consume less of them, and (iii) portable across a variety of interactions.

Table 1 shows categories that may be considered conspicuous. Our baseline definition, taken from Friehe and Mechtel (forthcoming), states that one major determinant of status concerns is the respect and admiration one gets from interaction with face-to-face groups such as colleagues and friends (see Anderson et al. 2012, Clark and Senik 2010, Senik 2009). It therefore also includes items that can be observed only vis-a-vis colleagues, friends, and family. With this wide definition, we address the assumption that items such as expensive TVs, golf clubs, furniture, and pianos are chosen also with regard to how they will be perceived by others. Additionally, as a robustness check, we will make use of the definitions both by Charles et al. (2009) who consider visible consumption to be expenditures on apparel (including jewelry), personal care, and vehicles in their exploration of the relative importance of conspicuous consumption among different ethnic groups in the US and by Heffetz (2011) who bases his basket of visible goods on a survey conducted in the US. As can be seen in Column (3) of Table 1, Charles et al. include only a small number of items in their definition, while the definition by Heffetz is somewhat broader. To further check for the robustness of our results, we will additionally use a basket of observable consumption goods that lies between our baseline definition and the one used by Charles et al. (Column 2). We assume that conspicuous consumption does *not* comprise items with zero or small visibility and/or low status effect such as insurance premia, books, food, utilities, tobacco, education and training, and pharmaceutical products, in line with the empirical literature referred to in Section 1.

INSERT TABLE 1 HERE

Our data comprises the four EVS waves 1993, 1998, 2003, and 2008. In total, we have information about 176,782 households, where the number of households per wave varies between 40,230 in 1993 and 49,720 in 1998. Table 2 contains the descriptive statistics, where all monetary figures reported were converted to euros and deflated to the year 1993 (deflators are constructed using the consumer price indices provided by the German Federal Statistical Office, *Statistisches Bundesamt*). The gambling expenditures question in the EVS captures expenditures on/in lotteries, betting shops, casinos, gaming machines, and online (sports) betting. As can be seen from Table 2, almost half of the households show gambling activities, with the mean yearly expenditures amounting to (converted) 157.16 Euro.

INSERT TABLE 2 HERE

4 Econometric Analysis

4.1 Baseline regressions

4.1.1 Empirical approach

Our econometric analysis consists of two steps. First, we perform logit estimations with a binary dependent variable that indicates whether a household participates in gambling (i.e., has gambling expenditures greater than 0). As a second step, we use detailed information on each household's gambling expenditures as the dependent variable in ordinary least squares estimations. Given the structure of our data with a significant share of households not engaging in gambling, it is important to test the robustness of our results by using other econometric approaches. In this respect, we estimated both double hurdle and tobit models in order to provide a reliable empirical analysis. Double hurdle models account for the

fact that households have to decide on two questions: (1) whether they want to participate in gambling at all, and (2) how much they want to spend on gambling when they indeed participate. Contrary to the tobit model, the double-hurdle approach allows both steps of households' decision to be determined by different processes. The results of our logit and OLS estimations are strongly supported by the tobit and double hurdle models, such that we rely on the former in the main part of our analysis, as they ease the interpretation. Results from the latter are discussed when we present our robustness checks (see Section 4.2.2).

Our key explanatory variable $\ln(\mathrm{CC}_i)$ represents the natural logarithm of household i's expenditures on conspicuous consumption according to our baseline definition. Following the prediction from our theoretical model, we expect it to have a positive influence on both the probability to participate in gambling activities and on the actual amount of gambling expenditures. With regard to our control variables, we follow the empirical literature on gambling behavior and include several variables which capture a household's wealth as well as socio-demographic characteristics. In line with Beckert and Lutter (2009, 2013), for example, we include the logarithm of household i's income in the respective year, $\ln(\mathrm{income}_i)$. The inclusion of this variable is necessary to correctly identify the effect of relative status concerns for a given income level. Hence, the results with respect to $\ln(\mathrm{CC}_i)$ do not simply mean that poorer or richer households engage more or less in gambling. As a robustness check, we split the sample and run separate regressions for the four quartiles of income, all of which are in line with the results detailed below. Hence we conclude that we can identify the influence of status concerns on gambling apart from income level aspects. The EVS data comprise information on households' savings, allowing us to incorporate the variable $\ln(\mathrm{savings}_i)$ which accounts for a household's stock of savings. As for income and expenditures on conspicuous consumption, savings enter our econometric model in log-form, which is in line with the related literature. However, as can be seen from our robustness checks, the chosen functional form does not drive our estimation outcomes. Further, we follow the literature (Beckert and Lutter 2009, Perez and Humphreys 2011) and control for the age (Age_i) and age squared

(Age_i^2) of the head of the household. To account for the socio-demographic structure of household i, we incorporate two additional control variables that capture its number of adults (# of adults_i) and children (# of children_i). Furthermore, the respective literature (see, e.g., Worthington 2001, Beckert and Lutter 2009, and Perez and Humphreys 2011) includes control variables capturing citizenship and gender. This is done here by the dummy variable Female_i which takes the value of 1 whenever the head of the household is a woman and 0 otherwise and the dummy variable Foreign_i which takes the value of 1 whenever the head of the household does not have a German citizenship. Differences might also occur with respect to whether the household's location is in East Germany, motivating the inclusion of the dummy variable East Germany_i which equals 1 whenever the household resides in a state belonging to the area of the former German Democratic Republic and 0 otherwise. This may be expected because the regime of the GDR idealized achievements obtained by hard work and the worker as a role model, for example. Moreover, we follow Beckert and Lutter (2009, 2013) and control for the urbanization of a household's place of residence. This is being accounted for in our econometric model by the dummy variable City_i, taking the value of 1 whenever the number of inhabitants of household i's city of residence exceeds 100,000. As a further control for a household's wealth, we include the variable Home owner_i. This dummy variable takes the value of 1 whenever the household is the proprietor of its house or flat and 0 otherwise. Finally, empirical evidence suggests that education has an influence on gambling behavior (see, e.g., Beckert and Lutter 2009, 2013, and Perez and Humphreys 2011). The EVS data allows us to incorporate information on educational levels into our econometric analysis. All waves contain information on whether a household's head holds a university degree and whether he or she has no school leaving certificate. Based on this information, we construct the dummy variables University degree_i and No school certificate_i.

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Our full econometric model reads as follows:

$$\text{Dependent variable}_i = \alpha_0 + \alpha_1 \ln(\text{CC}_i) + \alpha_2 \ln(\text{income}_i) + \alpha_3 \ln(\text{savings}_i)$$
$$+ \alpha_4 \text{Age}_i + \alpha_5 \text{Age}_i^2 + \alpha_6 \text{\# of adults}_i + \alpha_7 \text{\# of children}_i + \alpha_8 \text{Female}_i$$
$$+ \alpha_9 \text{Foreign}_i + \alpha_{10} \text{East Germany}_i + \alpha_{11} \text{City}_i$$
$$+ \alpha_{12} \text{Home owner}_i + \alpha_{13} \text{No school certificate}_i$$
$$+ \alpha_{14} \text{University degree}_i + D_j + \epsilon_i,$$

$$(22)$$

where $\text{Dependent variable}_i$ is a dummy variable indicating any gambling activity in the first set of estimations and the natural logarithm of each household's gambling expenditures in the second set of estimations. D_j contains dummies for wave j, $j = 1998, 2003, 2008$. As we will describe in more detail below, we start by estimating a model that includes only the explanatory variable related to conspicuous consumption, and then include more variables step-by-step until we end up with the full set of controls. In total, we have observations on $i = 176,751$ households, but due to omissions regarding socio-demographic household characteristics our estimations that include the variables $\text{\# of adults}_i$, and $\text{\# of children}_i$ are only based on $170,780$ households.

4.1.2 Results

We start by using the dummy variable Participation_i as our dependent variable which takes the value of 1 whenever a household spends a positive amount of money on gambling and 0 otherwise. The model is estimated using a logit estimator with heteroskedasticity-consistent Huber-White standard errors. Table 3 reports average marginal effects for all continuous regressors and marginal effects for discrete changes from 0 to 1 for all dummy variables. In the first estimation, we consider the logarithm of conspicuous consumption expenditures as the only explanatory variable. Column (1) of Table 3 clearly indicates that the probability to participate in gambling is higher when the household spends more on conspicuous con-

sumption. Next, we augment the model and stepwise include information about households' income levels, the stock of savings, and socio-demographic characteristics, until we end up with the model presented in equation (22) in Column (4). Our results reveal a highly significant effect of conspicuous consumption spending on the likelihood to spend a positive amount of money on gambling. The average marginal effect in our full model says that a 1%-increase in conspicuous consumption spending raises the probability to gamble by 3.2%. The marginal effects of our additional control variables turn out to have the expected signs given previous research on gambling behavior: we find a positive effect of income and the stock of savings. Households with a female head are less likely to participate in gambling. The marginal effect of Age_i is positive and significant at the 1%-level, the quadratic term is negative and significant. Our results further show that households from the former German Democratic Republic are less likely to gamble. The same holds for home owners and households from urban areas. With respect to households' educational levels, we find that holding a university degree or having no school-leaving certificate significantly decreases the probability of having positive gambling expenditures.

INSERT TABLE 3 HERE

The second step of our econometric analysis focuses on the actual amount spent on gambling activities. Our dependent variable ln(Gambling expenditures$_i$) captures the natural logarithm of household i's spending on gambling. As is common in the respective literature on consumption (and gambling) expenditures, our dependent variable enters the econometric model in log-form which allows for an interpretation of the estimated coefficients in terms of elasticities. We will see in the robustness checks later on that our results also hold when including all monetary variables (expenditures, income, savings) in linear form. We perform a number of ordinary least squares regressions using the same set of explanatory variables as above. Table 4 shows the coefficients of these estimations. Our inferences regarding conspic-

uous consumption are similar to those resulting from the logit estimations. A 1%-increase of expenditures on conspicuous goods increases gambling expenditures by 0.173% in our full model (Column 4). This finding supports our theoretical predictions: households which attach more importance to relative position (approximated by their consumption behavior) spend more on gambling. The signs and significance levels of our control variables resemble the ones presented in the logit estimations. Columns (5) to (8) of Table 4 rely on a restricted sample. Here, we focus only on households with a positive amount of spending on gambling activities. As can be seen from these estimations, there is still a positive coefficient of the explanatory variable that captures conspicuous consumption expenditures. Our logit estimations revealed that households with higher expenditures on conspicuous consumption are more likely to engage in gambling. Given this result, it is straightforward that the OLS point estimates of the regressions conditional on positive gambling expenditures are smaller than those of the unrestricted sample. However, the positive relationship between spending on conspicuous consumption and gambling expenditures is still highly significant.

INSERT TABLE 4 HERE

4.2 Robustness checks

In this section, we consider whether changing the precise definition of our key explanatory variable is critical to our results. Furthermore, we consider all monetary variables in linear form. Next, we discuss the results obtained from tobit and double-hurdle models.

4.2.1 Varying the definition of the key explanatory variable

Table 5 contains a number of robustness checks. In Column (1), we utilize our intermediate definition of conspicuous consumption expenditures, while we rely on the definitions by Charles et. al (2009) and Heffetz (2011) in Columns (2) and (3). Applying these alternative

measures does not change our conclusions. There is still a highly significant effect of conspicuous consumption expenditures on the probability to participate in gambling. Likewise, the results regarding our other control variables remain qualitatively unchanged. Note that we re-estimated every column of Table 3. In order to save space, we only present the results from the full model in Table 5. However, the results of these estimations not presented in Table 5 are also very similar to those presented in Table 3. Our results so far support our theoretical prediction that households with a greater emphasis on conspicuous consumption are more likely to participate in gambling activities.

INSERT TABLE 5 HERE

As for the logit estimations, we also use the alternative definitions of conspicuous consumption as robustness checks in our OLS regressions. A selection of the corresponding results is presented in Table 6. Our inferences are robust against the changes in the definition of the set of conspicuous goods; we find a highly significant positive effect of conspicuous consumption spending on households' gambling expenditures.

INSERT TABLE 6 HERE

4.2.2 Untransformed monetary variables and other econometric approaches

In addition to the regression results presented so far, we performed a number of further estimations to test for the robustness of our findings. First, we included the absolute levels of all monetary variables instead of their logs. Our inferences are robust to these changes; we still find a highly significant positive effect of conspicuous consumption expenditures on both the probability of engaging in gambling activities and the total amount spent on gambling. We abstain from presenting these results in detail here. Results are available upon request.

Given the structure of our data, one might argue that our dependent variable is censored as a significant share of households do not spend any money on gambling. We make use of tobit estimations to address this fact. The results confirm our findings based on the OLS estimations, regardless of which conspicuous consumption definition we choose and regardless of whether we use the logs or the absolute values of the monetary variables. The signs and significance levels of all coefficients turn out to be the same as those presented in Table 4.

However, the tobit model assumes that both the probability of engaging in gambling activities and the actual amount spent on gambling (if the household decides to have positive expenditures) are determined by the same process. This is in contrast to our empirical specification presented above, relying on a logit estimation to model the decision to participate in any gambling and then OLS estimations that focus on the amount spent on gambling (conditional on participation). Cragg (1971) presents the "double-hurdle" approach which allows both decisions to result from different processes. Following other studies using data of a similar structure, we relied on this approach and estimated a double-hurdle model using Stata's *craggit* command (Burke 2009) which combines a probit estimation with a truncated normal regression in the second step. Due to the similarity with our combined logit and OLS approach, these results are supportive of our previously presented findings. Detailed regression results are available upon request.

Given the stability of our central results when conducting these numerous robustness checks, we conclude that our results neither depend on the chosen estimation technique, the functional form of the econometric model nor on the definition of conspicuous consumption. Overall, we find strong support for the predictions stemming from our theoretical model. Households attaching a greater importance to relative position (as proxied by a household's emphasis on conspicuous consumption) are more likely to be extensively involved in gambling.

4.3   Repercussions of gambling participation for savings

A traditionally considered possibility of improving one's future well-being is saving money. However, saving need not improve the relative standing. To shed some light on the interconnection between conspicuous consumption and savings, we re-estimate equation (22), taking the natural logarithm of household i's savings in the period under consideration as the dependent variable. Our ordinary least squares regression results are presented in Table 7. The findings concerning conspicuous consumption are remarkable: irrespective of which definition of conspicuous consumption we apply, the coefficient reports a highly significant negative effect on savings. This result indicates that households substitute gambling for saving whenever they put great emphasis on relative consumption.

INSERT TABLE 7 HERE

5   Conclusion

The empirical importance of gambling is still a puzzle to many casual observers and researchers alike. We provide an explanation for the private desirability of gambling by referring to the empirically established fact that behavior is often motivated by (anticipated) outcomes of relative comparison. For many individuals who currently believe they have low economic status but at the same time put a lot of emphasis on relative standing when it comes to their well-being, winning the lottery may be the only legitimate way of significantly improving their relative position. Our empirical analysis strongly supports this idea, using household data representative for Germany and expenditures for conspicuous consumption as a proxy for the importance attached to status. In addition, our analysis yields results regarding the influence of numerous socio-economic and demographic variables, for example, showing that the likelihood of participation and the extent of involvement is lower for East

German households.

Our results suggest that gamblers are often motivated by the prospect of leapfrogging in status. This result is of great policy importance, because gambling has a low pay-out ratio and exacerbates poverty in expected terms. Indeed, our results suggest that status-oriented households seem to substitute gambling for conventional savings. However, the appropriate policy response is not easy to identify. The importance attached to relative standing is a characteristic of preferences, which are not easily manageable by a policy maker. An alternative path open to policy makers would be to improve information about the availability of other means to improve status, although this is not likely to fully redress the problem. Another obvious possibility is further restricting the availability of gambling, while Haisley et al. (2008) suggest the use of lottery-linked savings accounts.

Notes

[1]It is important to note that *subjective* status is relevant for privately optimal behavior, where this subjective position is partly determined by the individual when it determines the peer group, for example. There is evidence that the respect and admiration one gets from interaction with face-to-face groups such as colleagues and friends are a major determinant of status concerns (see Anderson et al. 2012, Clark and Senik 2010, Senik 2009). As a result, even subjects with an objectively high status may perceive to be disadvantaged in this regard.

[2]Konrad and Lommerud (1993) and Robson (1992) also provide explorations of risk taking when subjects care about their relative position.

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Table 1: Definitions of conspicuous consumption.

Category	Baseline	Inter-mediate	Charles et al. (2009)	Heffetz (2011)
Motor vehicles (new/used), motorbikes, bikes, water vehicles, aircraft (including commodities for motor vehicles)	X	X	X	X
Shoes	X	X	X	X
Apparel (women, men, children, babies), purses, shoulder bags	X	X	X	X
Jewelry, watches	X	X	X	X
Skin and body care: commodities and services	X	X	X	
Hosiery goods/headpieces	X	X		
Dental treatments & prostheses	X	X		
Furniture	X	X		X
Valuable electronic household appliances (other than washing machine, tumble dryer, fridge, freezer, or heater)	X	X		X
Phones, TVs, radio sets, cameras	X	X		X
Optical instruments, collections, art objects, music instruments, sporting and other leisure goods (e.g., games, toys)	X			X
Food and drinks in restaurants	X			X
Holidays	X			

Table 2: Descriptive statistics. Pooled over all waves (i.e., 1993, 1998, 2003, 2008).

Variable	Obs	Mean	Std. Dev.	Min	Max
Gambling participation	176751	.4721388	.4992246	0	1
Gambling expenditures	176751	157.1652	408.724	0	40025.89
Conspicuous consumption expenditures (CC)	176751	8989.581	12483.07	0	430765.8
Cons. cons. exp. (intermediate, CC_I)	176751	6269.867	11359.98	0	425642.9
Cons. cons. exp. (Charles et al., CC_C)	176751	4593.582	10489.6	0	422914.3
Cons. cons. exp. (Heffetz, CC_H)	176751	7515.761	11760.71	0	429350.2
Income	176751	52677.82	33682.85	0	893848.4
Savings (stock)	176751	8140.303	22084.45	0	2354567
Age	176751	49.95225	14.8522	20	85
# of children	171876	.739027	1.010776	0	5
# of adults	172348	1.7002	.4581717	1	2
Female	176751	.3129204	.4636836	0	1
Foreign	176751	.0155077	.1235609	0	1
Eastern Germany	176751	.2152916	.4110256	0	1
City	176751	.3183858	.4658514	0	1
Home owner	176751	.50914	.4999179	0	1
University degree	176751	.173668	.3788248	0	1
No school certificate	176751	.0157566	.1245329	0	1
Wealth formation	176751	15927.15	53148.41	0	2511223

	(1) Baseline definition	(2) Baseline definition	(3) Baseline definition	(4) Baseline definition
ln(CC)	0.058***	0.037***	0.035***	0.032***
	(0.001)	(0.001)	(0.001)	(0.001)
ln(Income)		0.055***	0.049***	0.056***
		(0.002)	(0.002)	(0.003)
ln(Savings)			0.008***	0.006***
			(0.000)	(0.000)
Age				0.020***
				(0.001)
Age^2				-0.0002***
				$(6 \cdot 10^{-6})$
# of children				-0.029***
				(0.001)
# of adults				0.065***
				(0.004)
Female				-0.030***
				(0.003)
Foreign				-0.021**
				(0.010)
East Germany				-0.013***
				(0.003)
City				-0.011***
				(0.003)
Home owner				-0.046***
				(0.003)
University degree				-0.126***
				(0.003)
No school certif.				-0.031***
				(0.010)
Wave dummies	yes	yes	yes	yes
N	176751	176751	176751	170780
Pseudo-R^2	0.02	0.02	0.02	0.04

Notes: This table presents average marginal effects of logit estimations (marginal effects of dummy variables indicate discrete changes from 0 to 1). The dependent variable *Participation* is binary and takes the value of 1 whenever a particular household spends a positive amount on gambling activities. The core explanatory variable ln(CC) captures a household's expenditures on conspicuous consumption according to our baseline definition (see Table 1). The control variables *Female*, *Foreign*, *East Germany*, *City*, *Home owner*, *University degree*, and *No school certificate* are dummy variables. All other explanatory variables are non-binary (see Table 2 for descriptive statistics). The dummy variable *East Germany* takes the value of 1 whenever a household is located in East Germany and the dummy variable *City* takes the value of 1 whenever a household resides in a city with more than 100,000 inhabitants. The variables ln(*income*) and ln(*savings*) capture yearly household income and the stock of savings as a proxy for permanent income. Estimations include wave dummies. The number of children and/or adults is unclear for some households in the EVS data. We therefore end up using 170,780 observations in estimations including these two explanatory variables (column 4). Heteroskedasticity-robust Huber-White standard errors are in brackets.

* significant at the 10 percent level, ** sign. at the 5 percent level, *** sign. at the 1 percent level.

Table 3: Determinants of households' participation in gambling activities.

	(1) Baseline def.	(2) Baseline def.	(3) Baseline def.	(4) Baseline def.	(5) Baseline def.	(6) Baseline def.	(7) Baseline def.	(8) Baseline def.
ln(CC)	0.334***	0.200***	0.187***	0.173***	0.087***	0.026***	0.024***	0.020***
	(0.006)	(0.007)	(0.007)	(0.008)	(0.004)	(0.005)	(0.005)	(0.005)
ln(Income)		0.359***	0.324***	0.381***		0.173***	0.169***	0.284***
		(0.012)	(0.012)	(0.015)		(0.008)	(0.008)	(0.011)
ln(Savings)			0.041***	0.026***			0.005***	-0.007***
			(0.002)	(0.002)			(0.001)	(0.001)
Age				0.122***				0.052***
				(0.003)				(0.002)
Age^2				-0.001***				-0.0003***
				$(2 \cdot 10^{-5})$				$(2 \cdot 10^{-5})$
# of children				-0.200***				-0.087***
				(0.008)				(0.005)
# of adults				0.386***				0.086***
				(0.020)				(0.013)
Female				-0.204***				-0.100***
				(0.017)				(0.011)
Foreign				-0.097*				0.024
				(0.051)				(0.034)
East Germany				-0.149***				-0.127***
				(0.016)				(0.011)
City				-0.034**				0.028***
				(0.014)				(0.009)
Home owner				-0.294***				-0.123***
				(0.016)				(0.009)
University degree				-0.766***				-0.233***
				(0.017)				(0.012)
No school certif.				-0.141***				0.062*
				(0.052)				(0.034)
Constant	-0.721***	-3.365***	-3.183***	-6.933***	4.723***	3.416***	3.433***	0.706***
	(0.053)	(0.100)	(0.100)	(0.137)	(0.038)	(0.073)	(0.073)	(0.101)
Wave dummies	yes	yes	yes	yes	yes	yes	yes	yes
N	176751	176751	176751	170780	83451	83451	83451	80519
R^2	0.02	0.03	0.03	0.06	0.02	0.03	0.03	0.08

Notes: This table presents coefficients of ordinary least squares estimations. The dependent variable ln(*Gambling expenditures*) captures a particular household's expenditures on gambling activities. The core explanatory variable ln(CC) captures a household's expenditures on conspicuous consumption according to our baseline definition (see Table 1). The control variables *Female*, *Foreign*, *East Germany*, *City*, *Home owner*, *University degree*, and *No school certificate* are dummy variables. All other explanatory variables are non-binary (see Table 2 for descriptive statistics). The dummy variable *East Germany* takes the value of 1 whenever a household is located in East Germany and the dummy variable *City* takes the value of 1 whenever a household resides in a city with more than 100, 000 inhabitants. The variables ln(*Income*) and ln(*Savings*) capture yearly household income and the stock of savings as a proxy for permanent income. In columns (5) to (8), the sample is restricted to those households who spend a positive amount on gambling. Estimations include wave dummies. The number of children and/or adults is unclear for some households in the EVS data. We therefore end up using 170, 780 (80, 519) observations in estimations including these two explanatory variables (columns 4 and 8). Heteroskedasticity-robust Huber-White standard errors are in brackets.
* significant at the 10 percent level, ** sign. at the 5 percent level, *** sign. at the 1 percent level.

Table 4: Determinants of households' expenditures on gambling activities.

	(1) Intermediate definition	(2) Charles et al. definition	(3) Heffetz definition
$\ln(CC)_I$	0.021***		
	(0.001)		
$\ln(CC)_C$		0.022***	
		(0.001)	
$\ln(CC)_H$			0.040***
			(0.001)
$\ln(\text{Income})$	0.067***	0.067***	0.050***
	(0.003)	(0.003)	(0.003)
$\ln(\text{Savings})$	0.006***	0.006***	0.006***
	(0.000)	(0.000)	(0.000)
Age	0.020***	0.020***	0.019***
	(0.001)	(0.001)	(0.001)
Age^2	-0.0002***	-0.0002***	-0.0002***
	$(6 \cdot 10^{-6})$	$(6 \cdot 10^{-6})$	$(6 \cdot 10^{-6})$
# of children	-0.030***	-0.031***	-0.029***
	(0.001)	(0.001)	(0.001)
# of adults	0.064***	0.062***	0.063***
	(0.004)	(0.004)	(0.004)
Female	-0.032***	-0.034***	-0.029***
	(0.003)	(0.003)	(0.003)
Foreign	-0.023**	-0.023**	-0.019**
	(0.010)	(0.010)	(0.010)
East Germany	-0.013***	-0.013***	-0.014***
	(0.003)	(0.003)	(0.003)
City	-0.009***	-0.009***	-0.011***
	(0.003)	(0.003)	(0.003)
Home owner	-0.047***	-0.047***	-0.046***
	(0.003)	(0.003)	(0.003)
University degree	-0.125***	-0.125***	-0.127***
	(0.003)	(0.003)	(0.003)
No school certif.	-0.033***	-0.033***	-0.029***
	(0.010)	(0.010)	(0.010)
Wave dummies	yes	yes	yes
N	170780	170780	170780
Pseudo-R^2	0.04	0.04	0.04

Notes: This table presents average marginal effects of logit estimations (marginal effects of dummy variables indicate discrete changes from 0 to 1). The dependent variable *Participation* is binary and takes the value of 1 whenever a particular household spends a positive amount on gambling activities. We vary the definition of our core explanatory variable: $\ln(CC)_I$ captures a household's expenditures on conspicuous consumption according to our intermediate definition, while $\ln(CC)_C$ and $\ln(CC)_H$ follow the definitions by Charles et al. and Heffetz (see Table 1). The control variables *Female*, *Foreign*, *East Germany*, *City*, *Home owner*, *University degree*, and *No school certificate* are dummy variables. All other explanatory variables are non-binary (see Table 2 for descriptive statistics). The dummy variable *East Germany* takes the value of 1 whenever a household is located in East Germany and the dummy variable *City* takes the value of 1 whenever a household resides in a city with more than 100,000 inhabitants. The variables $\ln(income)$ and $\ln(savings)$ capture yearly household income and the stock of savings as a proxy for permanent income. Estimations include wave dummies. The number of children and/or adults is unclear for some households in the EVS data. We therefore end up using 170,780 observations in estimations including these two explanatory variables (column 4). Heteroskedasticity-robust Huber-White standard errors are in brackets.

* significant at the 10 percent level, ** sign. at the 5 percent level, *** sign. at the 1 percent level.

Table 5: Robustness checks: Determinants of households' participation in gambling activities for different definitions of conspicuous consumption.

	(1) Intermediate def.	(2) Charles et al. def.	(3) Heffetz def.	(4) Intermediate def.	(5) Charles et al. def.	(6) Heffetz def.
$\ln(\text{CC})_I$	0.115***			0.011**		
	(0.007)			(0.005)		
$\ln(\text{CC})_C$		0.120***			0.010**	
		(0.007)			(0.005)	
$\ln(\text{CC})_H$			0.216***			0.033***
			(0.007)			(0.005)
$\ln(\text{Income})$	0.441***	0.443***	0.352***	0.292***	0.293***	0.274***
	(0.015)	(0.015)	(0.015)	(0.010)	(0.010)	(0.011)
$\ln(\text{Savings})$	0.028***	0.028***	0.026***	-0.006***	-0.006***	-0.007***
	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
Age	0.121***	0.121***	0.120***	0.052***	0.052***	0.052***
	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)
Age^2	-0.001***	-0.001***	-0.001***	-0.0003***	-0.0003***	-0.0003***
	$(3\dot{}0^{-5})$	$(3\dot{}0^{-5})$	$(3\dot{}0^{-5})$	$(2\dot{}0^{-5})$	$(2\dot{}0^{-5})$	$(2\dot{}0^{-5})$
# of children	-0.207***	-0.210***	-0.201***	-0.088***	-0.088***	-0.088***
	(0.008)	(0.008)	(0.007)	(0.005)	(0.005)	(0.005)
# of adults	0.384***	0.375***	0.377***	0.086***	0.086***	0.083***
	(0.020)	(0.020)	(0.020)	(0.013)	(0.013)	(0.013)
Female	-0.216***	-0.227***	-0.197***	-0.101***	-0.102***	-0.100***
	(0.017)	(0.017)	(0.017)	(0.011)	(0.011)	(0.011)
Foreign	-0.108**	-0.108**	-0.085*	0.022	0.022	0.026
	(0.051)	(0.051)	(0.051)	(0.034)	(0.034)	(0.034)
East Germany	-0.148***	-0.144***	-0.150***	-0.127***	-0.127***	-0.126***
	(0.016)	(0.016)	(0.016)	(0.011)	(0.011)	(0.011)
City	-0.025*	-0.023	-0.034**	0.029***	0.029***	0.028***
	(0.014)	(0.014)	(0.014)	(0.009)	(0.009)	(0.009)
Home owner	-0.301***	-0.299***	-0.293***	-0.124***	-0.124***	-0.122***
	(0.016)	(0.016)	(0.016)	(0.009)	(0.009)	(0.009)
University degree	-0.759***	-0.754***	-0.767***	-0.232***	-0.232***	-0.234***
	(0.017)	(0.017)	(0.017)	(0.012)	(0.012)	(0.012)
No school certif.	-0.154***	-0.154***	-0.130**	0.060*	0.060*	0.063*
	(0.052)	(0.052)	(0.052)	(0.034)	(0.034)	(0.034)
Constant	-7.005***	-7.008***	-6.948***	0.699***	0.696***	0.703***
	(0.137)	(0.137)	(0.136)	(0.101)	(0.101)	(0.101)
Wave dummies	yes	yes	yes	yes	yes	yes
N	170780	170780	170780	80519	80519	80519
R^2	0.06	0.06	0.06	0.08	0.08	0.09

Notes: This table presents coefficients of ordinary least squares estimations. The dependent variable $\ln(\textit{Gambling expenditures})$ captures a particular household's expenditures on gambling activities. We vary the definition of our core explanatory variable: $\ln(\text{CC})_I$ captures a household's expenditures on conspicuous consumption according to our intermediate definition, while $\ln(\text{CC})_C$ and $\ln(\text{CC})_H$ follow the definitions by Charles et al. and Heffetz (see Table 1). The control variables *Female*, *Foreign*, *East Germany*, *City*, *Home owner*, *University degree*, and *No school certificate* are dummy variables. All other explanatory variables are non-binary (see Table 2 for descriptive statistics). The dummy variable *East Germany* takes the value of 1 whenever a household is located in East Germany and the dummy variable *City* takes the value of 1 whenever a household resides in a city with more than 100, 000 inhabitants. The variables $\ln(\textit{Income})$ and $\ln(\textit{Savings})$ capture yearly household income and the stock of savings as a proxy for permanent income. In columns (4) to (6), the sample is restricted to those households who spend a positive amount on gambling. Estimations include wave dummies. Heteroskedasticity-robust Huber-White standard errors are in brackets.
* significant at the 10 percent level, ** sign. at the 5 percent level, *** sign. at the 1 percent level.

Table 6: Robustness checks: Determinants of households' expenditures on gambling activities for different definitions of conspicuous consumption.

	(1) Baseline def.	(2) Intermediate def.	(3) Charles et al. def.	(4) Heffetz def.
ln(CC)	-0.119*** (0.008)			
ln(CC)$_I$		-0.110*** (0.007)		
ln(CC)$_C$			-0.109*** (0.007)	
ln(CC)$_H$				-0.082*** (0.008)
ln(Income)	2.404*** (0.023)	2.388*** (0.022)	2.382*** (0.021)	2.369*** (0.022)
ln(Savings)	0.140*** (0.002)	0.139*** (0.002)	0.139*** (0.002)	0.139*** (0.002)
Age	-0.026*** (0.003)	-0.026*** (0.003)	-0.026*** (0.003)	-0.026*** (0.003)
Age^2	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
# of children	-0.192*** (0.006)	-0.185*** (0.006)	-0.183*** (0.006)	-0.192*** (0.006)
# of adults	-0.079*** (0.019)	-0.066*** (0.019)	-0.060*** (0.019)	-0.089*** (0.019)
Female	0.007 (0.015)	0.022 (0.015)	0.031** (0.015)	0.001 (0.015)
Foreign	-0.353*** (0.050)	-0.348*** (0.050)	-0.348*** (0.050)	-0.351*** (0.050)
East Germany	0.388*** (0.015)	0.388*** (0.015)	0.384*** (0.015)	0.387*** (0.015)
City	-0.134*** (0.012)	-0.140*** (0.012)	-0.141*** (0.012)	-0.137*** (0.012)
Home owner	0.109*** (0.014)	0.109*** (0.014)	0.109*** (0.014)	0.115*** (0.014)
University degree	-0.159*** (0.016)	-0.165*** (0.016)	-0.169*** (0.016)	-0.160*** (0.016)
No school certif.	-0.167*** (0.055)	-0.161*** (0.055)	-0.160*** (0.055)	-0.163*** (0.055)
Constant	-16.207*** (0.186)	-16.194*** (0.184)	-16.184*** (0.183)	-16.139*** (0.184)
Wave dummies	yes	yes	yes	yes
N	170780	170780	170780	170780
R^2	0.36	0.36	0.36	0.36

Notes: This table presents coefficients of ordinary least squares estimations. The dependent variable ln(*Wealth formation*) captures a particular household's savings in the period under investigation. We vary the definition of our core explanatory variable: ln(CC) refers to our baseline definition of conspicuous consumption, ln(CC)$_I$ captures a household's expenditures on conspicuous consumption according to our intermediate definition, while ln(CC)$_C$ and ln(CC)$_H$ follow the definitions by Charles et al. and Heffetz (see Table 1). The control variables *Female, Foreign, East Germany, City, Home owner, University degree*, and *No school certificate* are dummy variables. All other explanatory variables are non-binary (see Table 2 for descriptive statistics). The dummy variable *East Germany* takes the value of 1 whenever a household is located in East Germany and the dummy variable *City* takes the value of 1 whenever a household resides in a city with more than $100,000$ inhabitants. The variables ln(*Income*) and ln(*Savings*) capture yearly household income and the stock of savings as a proxy for permanent income. Estimations include wave dummies. Heteroskedasticity-robust Huber-White standard errors are in brackets.
* significant at the 10 percent level, ** sign. at the 5 percent level, *** sign. at the 1 percent level.

Table 7: Determinants of households' wealth formation for different definitions of conspicuous consumption.

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