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# Does The Financial Situation affect Cheating Behavior? An Investigation through Financial Literacy

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# DOES THE FINANCIAL SITUATION AFFECT CHEATING BEHAVIOR? AN INVESTIGATION THROUGH FINANCIAL LITERACY

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## Abstract

Using Dutch data from the LISS Panel, we study the effect of financial situation, love of money and general trust on multiple dimensions of individuals' dishonesty, namely benefits fraud, tax evasion, fare evasion and stealing property. We use two indices of financial literacy as instruments to deal with the potential endogeneity of financial situation. The financial situation significantly affects the propensity to engage in cheating related to shadow-economy activities; conversely, small-scale dishonesty is mainly influenced by personal characteristics such as attitudes towards risk aversion. We show that love of money might eventually cloud individuals' ethical behavior, as it increases the acceptability of immoral conduct. As expected, being trusting negatively affects the propensity to cheat, probably because it enhances individuals' social cooperation. Our results are useful to deepen our knowledge about the factors affecting cheating behavior and, consequently, think of ways to limit it.

**JEL Classification:** A13; C26; D91; H26.

**PsycINFO Classification:** 3120

**Keywords:** Cheating behavior; Financial situation; Financial literacy.

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## 1. Introduction

The increasing perception of dishonesty in everyday social interactions has led to define the concept of “*cheating culture*”, in which individuals justify cheating behavior, consider it as a means to achieve their goals and believe that everyone cheats in order to succeed (Crittenden *et al.*, 2009). Several theories have been developed on why individuals undertake unethical actions. According to the standard economic models, wealth-maximizing individuals maintain ethical behaviors as long as resulting rewards outweigh potential gains from unethical actions (Becker, 1968). Subsequently, Chang (1998) argues that it is perceived behavioral control, defined as “people’s perception of the ease or difficulty of performing the behavior of interest”, which guides people’s choices. Most recent approaches in explaining dishonesty show that individuals do not cheat as much as they can, because they are interested in maintaining a positive self-concept (Mazar *et al.*, 2008). Therefore, both economic incentives and psychological factors are significant predictors of unethical behavior, which could be related to individual attitudes, cultural traditions and socioeconomic conditions.

Previous literature relates cheating behavior with a range of socio-demographic variables. Dreber and Johannesson (2008) report that males lie more than females to secure monetary benefits; along this line, Friesen and Gangadharan (2012) find that men cheat more to achieve personal gains. In contrast, other authors have found no gender differences in ethical behaviors (Kidwell *et al.*, 1987; Singhapakdi and Vitell, 1990). Most studies consider age as a driving determinant of honest behavior (Torgler, 2006; Friesen and Gangadharan, 2012). Lago-Peñas (2010) finds a positive relation between age and the development of ethical standards; similarly, in the context of fiscal compliance, Torgler (2006) shows that tax morale rises with age. Occupational status and education may also influence dishonesty by changing the opportunities to offenders in several unethical activities (Anwar *et al.*, 2017).

In the present study we focus on the effect of financial situation as a new potential determinant of cheating attitudes, not yet explored in previous literature. According to Sharma *et al.* (2014), financial deprivation influences the acceptability of immoral conduct and this eventually compromises moral decisions. We expect that people more satisfied with their financial status might be less willing to engage in dishonest actions; conversely, those in difficult financial situations might cheat more as an attempt to improve their financial positions. Therefore, in estimating the impact of the financial situation on cheating behavior we face an issue of reverse causality; we deal with the potential endogeneity of financial situation through the instrumental variable approach.

We enrich the analysis by considering the role of “love of money” on cheating attitudes. People who value money highly are more likely to exhibit personality traits such as sensation seeking, competitiveness and materialism, which may be positively associated with cheating

behavior (Kirkcaldy and Furnham, 1993). Chen *et al.* (2014) demonstrate that the desire of being rich and the motivation attached to work hard for money predict unethical intentions among American and Chinese college students; similarly, Singhapakdi *et al.* (2013) find less ethical decision-making intentions among managers who display high money love.

We also investigate the effect of being trusting on attitudes towards cheating. According to Uslaner (1999) decisions to behave morally depend on how people expect others to act and on personal values, as they foster individuals' ethical standards of behavior (Fritzsche and Oz, 2007).

We combine the analysis of the determinants of cheating with the line of research on the relationship between financial literacy and financial behavior. According to previous findings, those who are more knowledgeable in financial matters have a better understanding of financial products, they are more likely to invest in risky assets and they save more for precautionary reasons (Van Rooij *et al.*, 2011; de Bassa Scheresberg, 2013). Individuals who are financially knowledgeable are also less likely to incur in high-transaction costs or expensive borrowing methods (Lusardi and Tufano, 2015); furthermore, using Dutch data, Alessie *et al.* (2011) demonstrate the positive causal effect of financial literacy on retirement preparation. Overall, financial knowledge has positive implications on several aspects of financial behavior. In this research, we focus on the role of financial literacy in influencing individuals' financial situation to estimate the causal effect of financial wellbeing on consumers' misbehaviors.

We use Dutch data from the LISS Panel, a longitudinal household survey based on a true probability sample of households living in the Netherlands. Our final sample consists of 1,228 observations for individuals who completed the questionnaire in year 2012.

Our research contributes to the existing literature in three main directions. First, we look at new potential determinants of individuals' dishonesty, namely financial situation, money love and general trust. Second, we consider multiple dimensions of cheating behavior: besides the analysis of tax evasion, which has been widely explored in earlier studies (Grundmann and Lambsdorff, 2017; Torgler, 2006; Robben *et al.*, 1990), we investigate the probability of claiming government benefits without any rights, stealing property and engaging in ordinary dishonest actions, such as travelling on buses without a valid ticket. Third, we estimate the causal impact of the financial situation on cheating behavior by using two indices of financial literacy as instruments to deal with the potential endogeneity of financial situation.

Our findings show that the financial situation is a significant determinant of cheating related to shadow-economy activities, like benefits fraud or tax evasion. While those who are more satisfied with their standards of living are less likely to justify claiming government benefits without any right, we find a positive effect of financial situation on the propensity to accept tax

evasion. By contrast, an improvement in financial situation does not make individuals less likely to engage in small-scale unethical actions. When we consider stealing property and fare evasion, we show that these components of cheating are mainly affected by personal characteristics and individual attitudes towards money. Moreover, we find a strong and significant role of risk aversion in reducing the acceptability of these unethical actions. In addition, we show that those who value money highly are more willing to justify all our cheating outcomes, except for benefits fraud; conversely, being trusting is significantly and negatively associated with all forms of misbehavior considered in our analysis.

The remainder of the paper is structured as follows: Section 2 introduces the data, together with the econometric model and the relevant variables used in the analysis. Section 3 presents the results and several robustness checks. We discuss some ideas for further research in Section 4; the last Section concludes.

## **2. Data**

### ***2.1. LISS Core Study and Assembled Studies***

In our research we use Dutch data from the LISS (Longitudinal Internet Studies for the Social sciences) panel. The LISS panel is based on a sample of the population registered by Statistics Netherlands. One member in the household provides the household data; households without the necessary technological infrastructure are provided with a computer and Internet connection. Survey data are collected by CentERdata (Tilburg University, The Netherlands). The survey is organized in eight modules, which cover questions on family and income, economic situation, work and schooling, social integration, health, personality, religion and ethnicity, politics and values.

In addition to the LISS Core Study, we consider data from two additional modules connected to the LISS core study: *World Values Survey* and *Financial Literacy*. The former is the Dutch version of the original survey administered to the panel members in December 2012; from here we obtain our measures of cheating, which we use as dependent variables in the analysis, and several additional variables that we relate to cheating behavior. The second one is a single wave study administered to the LISS panel in August 2011. It consists of 5 questions<sup>1</sup>: the first one is on self-assessed financial knowledge, while the other four test the respondent's knowledge of financial

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<sup>1</sup> The precise wording of these questions is reported in Appendix A.

concepts (i.e. interest rate, inflation, diversification, relationship between interest rate and bond prices) and can be used to build an index of financial literacy.

We use information from the LISS Core Study for respondents who completed the questionnaire in year 2012, when data about cheating behavior have been collected; the background variables are selected on the same month as the dependent variables used in our analysis. After combining these data with those from the assembled studies, we select participants in the economically relevant age range 18-80; this leaves a sample consisting of 8,008 observations. In doing our analysis, we consider no missing information from respondents who participated in all the surveys mentioned above. Our final sample consists of 1,228 observations<sup>2</sup>.

## 2.2. Econometric model

In performing our analysis we consider several determinants of unethical behavior and we focus on the relation between cheating and individuals' financial situation. The equation we estimate is specified as follows:

$$c_i = \beta_0 + \beta_1 \text{finsituation}_i + \beta_2 \text{lovemoney}_i + \beta_3 \text{generaltrust}_i + X_i' \beta_4 + F_i' \beta_5 + \varepsilon_i \quad (1)$$

where  $c_i$  represents the outcome variables on cheating attitudes for individual  $i$  and our variables of interest are *financial situation*, *lovemoney* and *general trust*.  $X_i'$  refers to a vector of explanatory variables that includes socio-demographic controls and a measure of risk aversion.  $F_i'$  is a vector of further control variables that we choose from the broader literature on consumer misbehavior; we include these variables in our specifications as a robustness check.  $\varepsilon_i$  is the error term.

For each binary dependent variable, we present estimations from a linear probability model with heteroskedasticity-consistent standard errors. However, we cannot simply rely on these estimates to assess the causal effect of financial situation on cheating, as we may face a problem of reverse causality: whilst individuals' financial situation determines their attitudes towards unethical behavior, it is also true that cheating might be performed with the purpose of improving financial situation. This implies that the coefficients estimated by these models might be biased; we deal with the problem of endogeneity by using our indices of financial literacy as instruments.

We compare our estimates with those from a linear 2SLS model. Despite ignoring the binary nature of the outcome variables, it is widely used in the literature and supported by much real-world

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<sup>2</sup> Descriptive statistics about the complete sample are similar to those reported in our analysis, supporting the representativeness of our data. Some differences arise in the percentage of married and religious people, who are slightly overrepresented in the final sample.

experience (Wooldridge, 2008; Angrist and Pischke, 2009); moreover, it is easily interpretable, and it allows us to test for the validity of our instruments<sup>3</sup>.

The choice of using financial literacy as an instrument is justified by the following reasons: first, there is considerable evidence suggesting that financial knowledge has a positive impact on individuals' financial satisfaction (Joo and Grable, 2004; Murphy, 2013). As we measure financial situation according to the respondent' satisfaction with her own financial status, we expect this relationship to be also valid in our context. Murphy (2013) finds a positive relationship between financial literacy and financial satisfaction of individuals, as rational financial attitudes foster the skills which are required to deal with financial matters. Gerrans *et al.* (2014) show that financial knowledge provides financial satisfaction, which in turn is a predictor of personal wellbeing. Greater financial literacy also explains behavioral changes in the long run. For instance, Bernheim *et al.* (2001) reports an increase in the accumulation of assets over time in countries where students were exposed to financial curricula during high school. Again, financial knowledge fosters the ability to deal with financial emergencies (Lusardi *et al.*, 2011) and it increases the capacity of accumulating wealth; in turn, we expect that saving allows individuals to improve their financial situations. Based on this evidence, we claim that financial knowledge has a positive impact on individuals' financial situation. Second, it might be argued that those who display deeper legal and financial knowledge are also aware of how to act strategically in order to cheat. Indeed, we may expect that those who are capable to exploit their knowledge to be financially successful might be particularly prone in disregarding others' interests by acting immorally. However, if this argument might hold for dishonest actions performed against institutions, such as tax evasion or benefits fraud, it does not apply to the other measures of cheating, which do not require specific financial knowledge. Moreover, those who, in our sample, display greater financial knowledge cannot be defined as "experts" in financial fields; knowledge of simple economics concepts, like those considered to create our indices, are not so sophisticated as to allow individuals to exploit them in order to cheat. Finally, our measures of cheating are not gauging actual behavior of individuals, but their tolerance towards some questionable actions; in our opinion, the justifiability of unethical behaviors considered in this study is mainly influenced by personal values and socio-economic conditions, rather than by individuals' knowledge of financial concepts. Therefore, we assume that our indices of financial literacy are not directly related to our measures of cheating.

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<sup>3</sup> We re-estimate our equations using probit and IV probit models to specifically account for the binary nature of the dependent variables; results are provided in Appendix B.

## 2.3. Key variables

### 2.3.1. Cheating measures

We obtain our indirect measures of cheating from the World Values Survey (LISS Panel version). Respondents are asked to indicate on a scale from 1 (*Never*) to 10 (*Always*) whether they justify or not some actions, among these: “*Claiming government benefits to which you are not entitled*”, “*Avoiding a fare on public transport*”, “*Stealing property*” and “*Cheating on taxes if you have a chance*”. We model our dependent variables as dichotomous ones, taking value one if respondents justify, even to a small extent, an incorrect behavior on the specific action (points 2 to 10 on the scale), and zero otherwise.

It should be noted that our dependent variables display very low variability, as most of respondents report they do not justify at all the dishonest behaviors described in the survey. It could be that interviewed people might under-report their real tendencies towards cheating, given the sensitive nature of the information asked. Another limitation of our measures of cheating is that they rely on the intention to behave correctly; while people may be more willing to “evaluate prospective behavior rather than admitting actual misdeeds”, there might be considerable differences between the real and the hypothetical behavior (Uslaner, 1999; Carlsson *et al.*, 2010).

### 2.3.2. Determinants of cheating behavior

#### *Financial situation*

The focus of our analysis is on financial situation, as we believe it strongly influences individuals’ perception about dishonesty: people who experience economic restrictions might be more likely to justify incorrect behaviors. Financial deprivation, which is a status of inferiority compared to the financial position of the peers, increases individuals’ willingness to cheat for financial gains, as shown in the literature on subjective wellbeing or moral hypocrisy (Barden *et al.*, 2005; Stone and Fernandez, 2008; Sharma *et al.*, 2013). At the same time, those who are more satisfied with their standards of living could be less willing to engage in dishonest behavior. As individuals’ perceptions about cheating eventually compromise their practical conducts, we want to explore this issue on our data. We measure financial situation from the income questionnaire of the LISS Core Study; respondents are asked to report their satisfaction with their financial situations on a Likert-scale ranging from 0 (*Not at all satisfied*) to 10 (*Entirely satisfied*).

It should be recalled that compliance with social norms is also influenced by economic factors such as changes in prices or available income (Halla and Schneider, 2014). The level of income provides objective information about respondents’ financial position; conversely, our

measure of financial situation is described by the satisfaction with one's current financial status, which might be related to consumer choices, job productivity and marital stress (Joo and Grable, 2004). Both financial situation and income might affect our dependent variables, but they are also correlated to each other. In particular, we expect the financial situation over life resembles the life course pattern of income (Plagnol, 2011). In line with this, Dolan *et al.* (2008) find that financial satisfaction mediates the effects of objective circumstances (i.e. income or financial status) on individuals' measure of personal wellbeing; again, Hira and Mugenda (2000) find that those who have higher household income and save more are more likely to report higher financial satisfaction.

Our benchmark analysis is eventually based on the effect of financial situation<sup>4</sup>. According to previous literature, subjective values and ethical principles have a deeper impact on moral behavior compared to other socio-demographic determinants (Uslaner, 1999). Dishonesty is not only driven by economic incentives; that it is why people usually engage in some levels of cheating, without updating completely their own morality<sup>5</sup>. The huge importance attached to subjective components in influencing cheating behavior justifies our choice of focusing on financial situation; it reflects the interviewee's feelings and satisfaction about her personal financial position, so we expect a greater effect of this subjective variable on individuals' attitudes towards dishonesty.

### *Love of money*

Recent literature has examined how love of money relates to unethical behavior. People with high love of money are those who want to be rich and consider money as an important symbol of success (Tang and Liu, 2012). Modern societies give even more importance to conspicuous consumption and economic success and this might have a negative impact on moral behavior (Crittenden *et al.*, 2009). According to Vitell *et al.* (2006), the more an individual agrees that money is important, the more likely she is to find acceptable some questionable consumer activities, such as those in which the customer benefits at the expenses of the seller. Money beliefs and values vary across individuals; besides its objective functions, money owns affective, symbolic and behavioral meaning, as it is associated to individuals' identity and self-concepts (Mitchell and Mickel, 1999).

We measure money love of the respondent by considering her agreement on the following item of the World Values Survey (LISS Panel version): "*It is important to this person to be rich; to*

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<sup>4</sup> Appendix Table D3 reports OLS estimates with household income as an additional explanatory variable; results are consistent.

<sup>5</sup> Shalvi *et al.* (2011) create the term "incomplete dishonesty" to indicate a behavior aimed in maintaining a favorable self-concept.

*have a lot of money and expensive things*”<sup>6</sup>. People with higher material aspirations display low subjective well-being (Easterlin, 2001); we argue that materialistic people, who value money highly, may be more likely to carry out dishonest actions in order to obtain financial gains.

### *General trust*

Decisions to behave morally depend largely on how people expect others to act. We measure the level of trust of individuals through the agreement on the following statement of the World Values Survey (LISS Panel version): “*I see myself as someone who is generally trusting*”<sup>7</sup>. We expect that people who trust others attach greater importance to social connections and they are more likely to put personal interest aside; therefore, they may be more willing to behave correctly.

### *2.3.3. Instruments: financial literacy*

Financial literacy is generally measured through three questions about key financial concepts (interest compounding, inflation, risk diversification). These questions were first administered in a special module for the 2004 U.S. Health and Retirement Study and they were added to other international surveys thereafter (Lusardi and Mitchell, 2014). The assembled study administered to the LISS panel presents these three standard questions and an additional one on the relationship between interest rate and bond prices. Although the questions vary in difficulty, none of them requires expert knowledge as they are not excessively complex. This notwithstanding, previous researches suggest that consumers’ knowledge of basic financial principles is very low, especially among women, those with lower educational attainment and the youngest (Lusardi and Mitchell, 2011a). Given the lack of financial knowledge, individuals might take suboptimal financial decisions, as they do not plan for retirement, they rely more on informal sources of financial information and they also borrow at higher costs (Lusardi and Mitchell, 2014).

Following Van Rooij *et al.* (2011), we perform a factor analysis on the financial literacy questions. We first define a dummy variable for the correct answer to each question. Consistently with previous literature, we create another dummy if the respondent states that she did not know the answer to the question; exploiting information from such a response is necessary in measuring financial literacy, as it characterizes individuals who know the least (Lusardi and Mitchell, 2011b). We combine financial literacy information on an index by performing the factor analysis with the principal component method. From this procedure we obtain two factors: one has heavy loadings on

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<sup>6</sup> This is a short description of another person; our measure of “*love of money*” is a dummy variable equal to 1 if the respondent states to be similar to that person (from “a little” to “very much” like her).

<sup>7</sup> We model “*general trust*” as a dummy variable equal to 1 if the respondent indicates that she is strongly agree with this sentence.

the simplest literacy questions, while the other is more heavily loaded on those about diversification and the relationship between interest rates and bond prices. Therefore, we retain two factors underlying the level of basic and advanced financial literacy, respectively. Barlett's test of sphericity ( $p < 0.001$ ) indicates that it is appropriate to use factor analysis. We assume that financial knowledge does not change between 2011, when the additional module on financial literacy has been administered, and 2012; while financial education provided at school might increase financial knowledge and skills of young individuals, we expect that financial literacy is rather stable among adults, who constitutes the great majority of our sample<sup>8</sup>.

#### 2.3.4. Control variables

Recent literature provides mixed evidence on the factors that mainly affect cheating behavior. The role of gender in influencing dishonest behavior has been investigated by Friesen and Gangadharan (2012), who find that men exhibit greater propensity to behave dishonestly, compared to women; in line with this, Crown and Spiller (1998) find that cheating behavior among males is significantly higher. Conversely, Ezquerro *et al.* (2018) report no gender difference in cheating once these are tested using the dice-paradigm. It could also be that males are more likely to report that they engaged in past cheating behaviors compared to females (Smith *et al.*, 2002). Other studies suggest that gender differences arise only when interpersonal relationships are involved, while men and women display in the same way when dishonest actions are non-relational. We expect that gender is a significant predictor of ethical behavior; therefore, we decide to control for this variable in our specifications. The effect of age is also relevant. Diekhoff *et al.* (1996) find that younger students cheat more than their older peers; Kelley *et al.* (1990) show that age positively influences ethical behavior, as individuals develop a greater understanding of honesty as they grow up. Similarly, Peterson *et al.* (2001) find that older people possess higher ethical principles and that gender differences decrease as people grow older. In the context of tax evasion, Torgler (2006) finds that being married correlates negatively to cheating behavior; married people or those with children are more constrained by their social networks, so they might be more oriented to comply with social norms to maintain respectable social positions. Occupational status and education may also influence cheating behavior. As an example, workers who are self-employed have greater opportunities to underreport their incomes to pay less taxes, compared to individuals who are employed on a contractual basis.

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<sup>8</sup> We repeat our analysis by considering only respondents older than 25, as individuals in this age range should have completed their educational path, achieving a stable level of knowledge; results are consistent.

Based on this short discussion, we include several socio-demographic indicators as control variables in our specifications. Finally, we consider a dummy variable to account for risk aversion; as people's unethical behaviors involve some risks, we argue that individuals who are more risk averse are also less likely to cheat (Eishenauer *et al.*, 2011).

### 2.3.5. Descriptive statistics

Table 1 provides summary statistics on the relevant variables used in our analysis. The averages of the dependent variables are rather low. In particular, about 13% of individuals consider acceptable to claim not entitled government benefits and 9% of them justify dishonest behavior regarding property stealing. The percentage of individuals who accept free riding is higher (35%); it can be considered as less serious compared to other dishonest behaviors. Cheating on taxes is what could provide the greatest monetary benefits; it is justified by about 37% of the sample. The average age of the respondents is 54, about 52% are women and 9.7% of the individuals have college education. More than half of the individuals are married and 41% of them live in a highly urbanized area. Overall, 43.6% of respondents are employees, while self-employed individuals constitute only 3.3% of our sample. In our sample, 23.4% of the individuals consider money and wealth to be important and most of them state to be satisfied about their financial situation, with an average of 6.7 out of 10; 41% of respondents declare to be generally trusting. As expected, knowledge of basic financial concepts is higher (88.2%) than the average level of advanced financial knowledge (37.3%).

TABLE 1 ABOUT HERE

## 3. Results

### 3.1. Shadow-economy activities

We first discuss the impact of financial situation, love of money and general trust on benefits frauds and tax evasion; these outcomes represent cheating behavior associated with "shadow-economy activities".

Tax evasion has been mainly analyzed as a problem of choice under uncertainty (Allingham and Sandmo, 1972); people compare the benefit of lower fiscal burdens with the cost of punishment in the event they were caught (Gneezy, 2005). The costs associated with tax evasion are not only monetary; behaving illegally has high moral costs that arise from the feeling of shame about evading, especially when cheating is not accepted from a social point of view (Torgler and

Schneider, 2007; Bosco and Mittone, 1997). Therefore, decisions about tax compliance may also be driven by moral rules and by individual preferences (Torgler, 2003).

Several factors might also determine individuals' decisions about cheating on government benefits. The Dutch government provides a number of welfare benefits and allowances for citizens and residents in the Netherlands; examples of government benefits are healthcare allowances, rent benefits or childcare assistance. People who deliberately apply for government benefits to which they are not entitled are committing fraud.

Regression results from different specifications of Equation (1) are reported in Table 2. For each dependent variable considered in this section, we present the results from the linear probability model (Columns 1 and 3) and from instrumental variables estimations, where financial situation has been instrumented using our two indices of financial literacy (Columns 2 and 4).

#### TABLE 2 ABOUT HERE

According to Column 1 of Table 2, an improvement in satisfaction about financial situation is associated with a lower likelihood (1.6 percentage points) of accepting incorrect behaviors related to government benefits. As expected, financial satisfaction influences people's perceptions about morality; individuals who are more satisfied with their standards of living are more critical in judging dishonest behaviors. Conversely, the results reported in the third column of Table 2 show that the correlation between financial situation and the propensity to evade taxes is not statistically significant.

However, these estimates cannot be interpreted causally. Government subsidies are mainly granted to citizens in difficult financial conditions, which might improve after receiving financial support. The same is true when considering the propensity to cheat on taxes. Benefits fraud and tax evasion have a significant impact on the size of the shadow economy; these fraudulent activities might provide individuals with large monetary payoffs, improving their financial conditions. This suggests that the effect of financial situation on these outcomes is endogenous as we face an issue of reverse causality.

We account for the potential endogeneity of financial situation by using our indices of financial literacy as instrumental variables. We employ our two indices of financial literacy<sup>9</sup> to account for the endogeneity of financial situation. The Sargan test indicates no rejection of instruments' exogeneity and from the Hausman test we find evidence in favor of the endogeneity of

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<sup>9</sup> Appendix C reports results for the tests of our instruments.

financial situation. The F-statistic is above the recommended value to avoid the weak instruments problem (Staiger and Stock, 1997).

The IV estimates in Column 2 of Table 2 show that the relationship between financial situation and the propensity to cheat on government benefits remains negative and statistically significant at 1% significance level. We find that those who are more satisfied with their standards of living are less likely to justify claiming on government benefits without any right; however, the effect of financial situation is even bigger in size compared to those provided by the model in Column 1. Therefore, after accounting for the endogeneity of financial situation, we find that the effect of financial situation in reducing incorrect behavior is above and beyond the one estimated by the linear probability model. The most interesting result arises when we consider the propensity to evade taxes as dependent variable; after accounting for the endogeneity of financial situation, we find that people who are more satisfied with their financial positions are 9.3 percentage points more likely to accept tax evasion (Column 4). This effect is strongly significant from both a statistical and an economic perspective. Although we generally expect an inverse relationship between financial situation and individuals' misconduct, we should notice that better financial situations are generally associated with higher income levels; the rich might display lower tax morale because their compliance implies a greater loss of income. Public good games also confirm this result, as income has been found to be negatively correlated with fiscal contributions (Cherry *et al.*, 2005; Duch and Solaz, 2015).

Many researchers have discussed the effects of money on human behavior and considerable evidence shows that love of money may eventually cloud individuals' ethical attitudes (Tang and Chiu, 2003; Vitell *et al.*, 2007). Those who value money highly are less sensitive to social problems and more likely to achieve higher social status and recognition (Vohs *et al.*, 2006). While money love is not a significant determinant of the first measure of cheating considered in Table 2, our results on tax evasion confirm that those who attach more importance to money and wealth are more likely to behave dishonestly. In particular, according to the IV estimates in Column 4, love of money increases the propensity to cheat on taxes by 9.3 percentage points. In line with Torgler (2003), results from Table 2 suggest that decisions on tax compliance are also influenced by moral attitudes.

Interestingly, the effect of being trusting is strongly significant and negative for all the specifications reported in Table 2; in particular, it decreases the propensity of justifying benefits fraud and tax evasion by 5.7 and 7.7 percentage points, respectively (Columns 2 and 4). A possible explanation is that people who trust others believe that peers would not act contrary to their own interests; they might be more likely to behave honestly, putting self-interest aside (Uslaner, 1999).

The impact of socio-demographic characteristics on the propensity to claim government benefits without any right is not overall significant when we consider the instrumental variables estimates (Column 2). This might be related to the lower precision of the IV estimates, as indicated by larger standard errors reported in Columns 2 and 4 of Table 2.

However, when we consider the last specification reported in Table 2, we find that being female, married or living in a high urban city have a significant negative effect on the propensity of justifying tax evasion. Our findings are in line with previous literature showing that women exhibit greater propensity to comply with tax payments, consider the fiscal system as fairer and overestimate the penalties for tax evasion (Kinsey, 1992; Rosenbaum *et al.*, 2014). Moreover, married people might be more likely to comply with social norms because they face greater social constraints (Torgler, 2006). Interestingly, those living in highly urbanized areas are less likely to accept tax evasion. It may be that good institutions increase citizens' well-being, making them more likely to comply with fiscal rules; the costs of illegal activities might be perceived as higher for people living in highly urbanized areas also for the presence of greater institutional accountability (Torgler and Schneider, 2007).

### **3.2. *Small-scale cheating behavior***

Besides the components of cheating analyzed in the previous Sub-section, there are other forms of small-scale dishonesty that are extremely costly for the society. Some examples are stealing from one's employer, illegally downloading music from the web, cheating on an exam or using public transportation without paying the ticket. These unethical behaviors do not provide large financial benefits to individuals but have the largest social and economic consequences (Buccioli *et al.*, 2013). In our analysis, we consider fare evasion and property stealing as expressions of small-scale dishonesty; Table 3 reports regression results from Equation (1) for these cheating outcomes.

According to the Hausman test, the OLS estimates do not differ significantly from the IV estimates; the exogeneity of financial situation is not rejected. The assumption of instruments exogeneity finds statistical support in Sargan test of the overidentifying restrictions.<sup>10</sup> For this reason, we rely on the linear probability model to discuss the effects of our regressors on the dependent variables under considerations. Estimation results from the OLS regressions are presented in Table 3; we report the corresponding IV estimates in Appendix Table B3. Indeed, we

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<sup>10</sup> Sargan test of overidentifying restrictions for the variable "fare evasion" is equal to 0.485 with a p-value of 0.486. It is equal to 1.222 with a p-value of 0.269 for the variable "property stealing".

expect that financial gains arising from free riding or stealing property are not as relevant as to impact on the financial situation of the cheater.

### TABLE 3 ABOUT HERE

Those who state to be financially satisfied usually report higher savings and household income (Hira and Mugenda, 2000); therefore, we might expect that individuals who do not face financial constraints are less incentivized to cheat, especially for a low stake. However, we do not find evidence of a significant association between our measure of financial situation and the propensity to engage in small-scale unethical activities. Indeed, an improvement in financial situation does not make individuals less likely to engage in fare evasion or property stealing, meaning that economic gains are not the most significant predictors of small-scale dishonesty. As stated by Fischbacher and Gächter (2010) analyzing free riding in public goods experiments, only a minority of individuals is motivated by pure income-maximization reasons; cooperation is determined by personal beliefs and, mainly, by expectations about peers' contribution. In line with De Angelo *et al.*, (2016) we show that personal characteristics and preferences for decision making under uncertainty are more important in explaining variation in small-scale cheating behavior; indeed, we find sizable and significant effects on money love and risk aversion, respectively. Even if fare evasion provides only a small benefit, as the cost of a bus ticket is generally small, we find that those who value money highly are 5.7 percentage points more likely to justify free riding on public transport (Column 1); this is in line with Delbosc and Currie (2016), who find that deliberate evaders believe it is acceptable to bend the rules to save money.

The effect of love of money on the propensity to steal property is also positive and statistically significant; Column 2 of Table 3 shows that people who consider important to be rich are 4.3 percentage points more willing to accept this form of cheating. This finding is similar to what we have found for other components of cheating; money seems to be involved in much unethical behavior as it enhances individualism and it diminishes communal motivations (Vohs *et al.*, 2006).

Differences in risk aversion and in perceptions with respect to the probability of getting caught also affect the propensity to cheat. In line with Jing and Cheo (2013), we find that risk aversion is negatively correlated with the propensity to accept fare evasion and property stealing. In particular, those who are more risk averse are 10.6 percentage points less likely to accept free ride on public transport and 6.1 percentage points less willing to steal property; they might resist the

temptation of cheating because they evaluate more critically the eventual punishment associated to these unethical actions.

Being trusting decreases the propensity of justifying small-scale cheating behavior. It is possible that those who believe most people can be trusted identify themselves as part of a social group and develop strong mutual connections. In turn, shared group identity might enhance virtuous behaviors (Della Valle and Ploner, 2017); we argue that when individual and collective interests are the same, people are less incentivized to “free ride”.

We find statistically significant effects of socio-demographic indicators on the propensity to engage in fare evasion and property stealing; we show that married respondents are less likely to accept fare evasion, as they might possess higher ethical principles and be more oriented to comply with social norms (Peterson *et al.*, 2001). We find that young respondents are more willing to accept small-scale unethical actions. Students or young workers might represent the most significant market group in transit ridership; results on fare evasion are in line with Buccioli *et al.* (2013), who show through a field experiment that young individuals are more likely to travel without a valid ticket. These findings support previous literature indicating that younger people are more ethically permissive than older individuals, who possess higher moral values (Peterson *et al.*, 2001; Longenecker *et al.* 1989). We find that being an employee increases the tendency to evade fares on public transport. Organ and Ryan (1995) argue that job attitudes are significant predictors of personal behavior in the field. Those who are employed on a contractual basis are usually affected by organizational choices made by other individuals belonging to the same organization; when supervisor’s decisions are perceived as unfair, workers may try to restore fairness by indulging in dishonest behavior also outside organizational borders (Della Valle and Ploner, 2017). The overall impact of education on cheating attitudes is difficult to determine *a priori* (Ehrlich, 1975). Anwar *et al.*, (2017) find that the effect of education on unethical behavior depends on the way it changes the available opportunities to offenders in several illegitimate activities. In our sample, we do not find a significant impact of education on small-scale dishonesty. Further research is needed to clarify the relationship between education and cheating behavior; similar considerations hold for occupational status. Other control variables show insignificant impact on the same outcomes.

The standard analysis of free-rider problem assumes that people are rational and they weigh more personal interests than collective benefits (He, 2012). We show here that decisions to behave dishonestly do not result only from financial advantages; personal characteristics and individual attitudes towards money and risk aversion are the most significant predictors of small-scale unethical activities.

### **3.3. Robustness checks**

#### *3.3.1. The estimation model*

The dependent variables used in our analysis are constructed by assigning a positive value when cheating is considered justifiable by the respondent, even to a small extent; conversely, the value 0 represents the extreme opinion “Never justifiable”. We re-estimate our equations using probit and IV probit regression models to specifically account for the binary nature of the dependent variable; the estimates are provided in Appendix B. Results are very similar in sign and significance to those presented above, confirming the robustness of our findings.

#### *3.3.2. The definition of the instruments*

In the previous analysis, we have presented IV estimates by using two continuous instruments for one endogenous variable. As a robustness check, we estimate again our IV models with alternative binary instruments for financial literacy. The values of the financial literacy indices are mainly clustered towards the extremes of the distributions; therefore, we define a dummy variable equal to one if the respondent scores above the average level of basic and advanced financial literacy in the sample, respectively, and zero otherwise. Appendix Table D1 shows that the effects of financial situation, love of money and general trust are very similar, in terms of size and significance, to those previously estimated even when we consider two dummy variables as instruments.

Our findings are consistent even when we consider only basic financial literacy as an instrument for the endogenous financial situation. We state that knowledge of simple economics concepts is not so sophisticated as to be exploited by individuals to act immorally; this is even more valid when we focus on knowledge of basic financial concepts. Regression estimates in the case of exact identification are reported in Appendix Table D2.

#### *3.3.3. Further control variables*

We control for additional determinants of cheating to limit the possibility that our results were driven by omitted variables. We do not include the whole set of control variables in the baseline specifications as we prefer a more parsimonious model, which increases precision of estimation<sup>11</sup>.

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<sup>11</sup> The standard errors of the estimated coefficients slightly increase when we include additional control variables.

We control for the national origin of the respondent, as it might produce a sense of identification with her own country that encourages cooperative behavior; according to De Cremer *et al.* (2001) “sense of belonging” might increase citizens’ level of social cooperation. We add another variable to represent religiosity, since it might encourage individuals to behave correctly by imposing moral constraints on their behaviors (Torgler, 2006). We consider a dummy variable equal to 1 if the respondent states to have a great deal of choice and control over her life, and 0 otherwise. According to Verme (2009), freedom of choice and control are the best predictors of individuals’ life satisfaction; previous literature provides evidence about the role of life satisfaction in influencing subjective well-being and happiness, which are positively related with ethics (James, 2003; Bruni and Stanca, 2003). The other way around, Carbonell and Gërkhani (2016) identify a negative correlation between tax evasion and life satisfaction. Therefore, people with higher locus of control might be more satisfied with their own lives and, in turn, less likely to engage in unethical behaviors. We also include a variable equal to 1 if respondents consider important to learn values like tolerance and respect for other people, as proxy for moral principles. Finally, we control for trust in government, since individuals might be more likely to comply with rules of a State that acts trustworthily.

We report the new estimates in Table 4. We find that the effects of our main variables of interests (love of money, financial situation and general trust) remain stable in sign and significance when we add the new variables and we include additional controls for educational attainments, confirming the robustness of our findings. The marginal effect of financial situation is about the same as in the baseline estimations discussed above. The exogeneity test is not rejected when we consider the effect of financial situation on free riding and property stealing. The effect of financial situation on cheating on government benefits and on tax evasion is still consistent when we consider the instrumental variables approach.

Our findings remain consistent even when we add household income<sup>12</sup> as an explanatory variable in the OLS specifications. Appendix Table D3 shows that financial situation is still negatively associated with the propensity to accept benefits fraud; conversely, it is not significantly related to the other measures of cheating. These findings are similar to those obtained in the baseline OLS regression models. The estimated coefficients on love of money and general trust also exhibit the same patterns.

TABLE 4 ABOUT HERE

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<sup>12</sup> We consider a variable measuring net household income in Euros.

## 4. Discussion

In this paper we explore the determinants of cheating behavior by using Dutch data from the LISS panel. One concern in the above analysis is that our measures of cheating rely on the intention to behave correctly; as they consider self-reported data, they are not free of bias (Swamy *et al.*, 2001). The level of honesty measured in our sample might overstate the real one, because people are only asked whether they justify hypothetical behaviors and not if they have been engaged in it; it is also possible that those who have been involved in questionable activities in the past tend to excuse such behavior declaring a low justifiability (Torgler and Schneider, 2007). This is the main limitation of our research.

We plan to expand this work in several directions. We obtain our measure of cheating from the original World Values Survey, which explores values and beliefs of people in almost 100 countries. According to Gächter and Schulz (2016), the willingness to follow rules is widespread in countries which are more collectivist and present strong institutions; conversely, people living in corrupted social environments, where cheating goes often unpunished, may increase their tolerance of dishonesty. Further research might be addressed to explain cross-country differences in attitudes towards cheating, as well as the impact of cultural factors and economic conditions on it.

Another direction for further research involves investigating the effect of ethical education received in early life on subsequent orientation towards cheating. Knowing that parents have a strong influence on children's socialization and moral development (Houser *et al.*, 2016), it could be interesting to see whether those who internalized ethical concepts in the family environment are more likely to behave honestly throughout their life.

## 5. Conclusions

We explore the effect of financial situation, love of money and general trust on cheating behavior. We analyze the impact of these variables both on dishonesty associated to shadow-economy activities, like benefits fraud or tax evasion, and on small-scale unethical activities, like fare evasion and property stealing. We rely on the role of financial literacy in influencing individuals' financial situation as an instrument to assess the causal impact of financial situation on unethical behavior.

We find that those who are more satisfied with their standards of living are less likely to justify claiming on government benefits without any right. Interestingly, after accounting for the endogeneity of financial situation, we show that people who are more satisfied with their financial

positions are more likely to accept tax evasion, probably because fiscal compliance for wealthy individuals implies a considerable loss of income.

By contrast, an improved financial situation does not make individuals less likely to engage in small-scale unethical actions. The main assumptions underlying the analysis of free-rider problem are that people are rational and weigh more personal interests than collective benefits (He, 2012). In our analysis, we show that decisions to behave dishonestly do not result only from financial advantages: personal characteristics and individual attitudes towards money and risk aversion are the most significant predictors of small-scale dishonesty.

The present research confirms previous evidence stating that money love may eventually cloud individuals' ethical attitudes (Tang and Chiu, 2003; Vitell *et al.*, 2007). Conversely, being trusting decreases the propensity to justify all the cheating outcomes considered in our analysis; it is possible that those who believe most people can be trusted identify themselves as part of a social group, developing strong mutual connections and putting self-interest aside (Uslaner, 1999).

Our analysis is useful to deepen our knowledge about the factors affecting individuals' cheating behavior and, consequently, think of ways to limit it. We are aware that it is difficult to act directly on individuals' financial situation; however, we show that money love and trust in others also have a significant impact on personal attitudes towards cheating. Thus, it might be important to strengthen moral values and money beliefs among citizens, since they may affect individuals' ethical actions; improving social cooperation may also be an effective way to reduce dishonesty.

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The authors whose names are listed below certify that they have NO affiliations with or involvement in any organization or entity with any financial or non-financial interest in the subject matter or materials discussed in this manuscript.

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**Table 1.** Average sample statistics

Variable	Mean	Std.Dev.	Min	Max
<i>Dependent variables</i>				
Benefits fraud	0.129	0.336	0	1
Tax evasion	0.367	0.482	0	1
Fare evasion	0.353	0.478	0	1
Stealing property	0.093	0.290	0	1
<i>Socio-demographic characteristics</i>				
Age	54.168	15.33	18	80
Female	0.519	0.500	0	1
Number of children	0.563	0.987	0	6
Married	0.542	0.498	0	1
High urban	0.410	0.492	0	1
Employee	0.436	0.496	0	1
Self-employed	0.033	0.180	0	1
College	0.097	0.296	0	1
Household income	2,515.103	1,524.057	0	13,500
<i>Main regressors</i>				
Love of money	0.234	0.423	0	1
Financial situation	6.700	1.786	0	10
General trust	0.410	0.492	0	1
<i>Instrumental variables</i>				
Basic financial literacy	0.882	0.182	0.015	1
Advanced financial literacy	0.373	0.270	0	0.874
<i>Further control variables</i>				
Risk aversion	0.598	0.490	0	1

Note: data are from 2012 LISS Core Study and from the additional modules *World Values Survey* and *Financial Literacy*. The final sample consist of 1,228 observations.

**Table 2.** Cheating related to shadow-economy activities

	Benefits fraud		Tax evasion	
	(1) OLS	(2) IV	(3) OLS	(4) IV
Financial situation	-0.016*** (0.006)	-0.088*** (0.032)	0.009 (0.008)	0.093** (0.039)
Love of money	0.037 (0.026)	0.040 (0.027)	0.096*** (0.035)	0.093*** (0.036)
General trust	-0.049*** (0.019)	-0.057*** (0.020)	-0.086*** (0.027)	-0.077*** (0.029)
Age: below 30	0.076 (0.048)	0.028 (0.056)	-0.057 (0.061)	-0.002 (0.068)
Age: below 65	0.034 (0.025)	-0.031 (0.038)	-0.013 (0.040)	0.062 (0.055)
Female	-0.023 (0.020)	-0.029 (0.021)	-0.121*** (0.028)	-0.114*** (0.029)
Number of children	0.016 (0.011)	0.002 (0.013)	-0.002 (0.015)	0.013 (0.017)
Married	-0.012 (0.021)	0.028 (0.028)	-0.027 (0.029)	-0.073* (0.038)
High urban	-0.001 (0.020)	-0.007 (0.021)	-0.057** (0.028)	-0.051* (0.029)
Employee	0.011 (0.025)	0.061* (0.035)	-0.017 (0.034)	-0.076* (0.045)
Self-employed	0.042 (0.067)	0.077 (0.073)	0.054 (0.078)	0.014 (0.087)
College	0.018 (0.036)	0.050 (0.040)	-0.017 (0.048)	-0.055 (0.052)
Risk averse	-0.031 (0.021)	-0.020 (0.022)	-0.035 (0.029)	-0.047 (0.031)
Constant	0.242*** (0.049)	0.727*** (0.220)	0.461*** (0.068)	-0.108 (0.271)
Observations	1,228	1,228	1,228	1,228
R-squared	0.036		0.047	
F-statistic		18.299		18.299
Sargan test p-value		0.636		0.614
Exogeneity test p-value		0.013		0.021

Note: this table presents coefficient estimates on cheating related to shadow-economy activities using OLS (Columns 1 and 3) and IV (Columns 2 and 4) regression models. Heteroskedasticity-consistent standard errors are in parentheses. \*\*\*, \*\*, \* denote significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

**Table 3.** Small-scale cheating behavior

	Fare evasion (1) OLS	Stealing property (2) OLS
Financial situation	0.001 (0.008)	-0.004 (0.004)
Love of money	0.057* (0.034)	0.043* (0.023)
General trust	-0.093*** (0.026)	-0.047*** (0.016)
Age: below 30	0.218*** (0.059)	0.074* (0.041)
Age: below 65	0.049 (0.037)	0.047** (0.022)
Female	0.010 (0.027)	-0.013 (0.016)
Number of children	0.030* (0.015)	0.010 (0.010)
Married	-0.059** (0.029)	0.019 (0.017)
High urban	0.034 (0.027)	0.008 (0.017)
Employee	0.088*** (0.034)	-0.006 (0.022)
Self-employed	0.059 (0.079)	-0.057 (0.048)
College	0.079 (0.048)	0.041 (0.036)
Risk averse	-0.106*** (0.029)	-0.061*** (0.019)
Constant	0.329*** (0.067)	0.117*** (0.038)
Observations	1,228	1,228
R-squared	0.091	0.043

Note: this table presents coefficient estimates on small-scale cheating behavior using OLS regression model. Heteroskedasticity-consistent standard errors are in parentheses. \*\*\*, \*\*, \* denote significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

**Table 4.** Robustness check: additional control variables

	Benefits fraud (1) IV	Tax evasion (2) IV	Fare evasion (3) OLS	Stealing property (4) OLS
Financial situation	-0.094** (0.040)	0.091* (0.049)	0.000 (0.008)	-0.000 (0.005)
Love of money	0.036 (0.029)	0.096** (0.038)	0.067* (0.036)	0.044* (0.024)
Gen. trust	-0.058*** (0.022)	-0.078** (0.031)	-0.087*** (0.028)	-0.040** (0.016)
Dutch origin	0.029 (0.039)	-0.030 (0.052)	-0.023 (0.037)	-0.026 (0.024)
Believer	-0.003 (0.022)	-0.038 (0.031)	-0.046 (0.029)	-0.018 (0.017)
Control	0.006 (0.032)	-0.088** (0.043)	-0.031 (0.030)	-0.057*** (0.017)
Education: intermediate	-0.004 (0.026)	0.001 (0.038)	0.010 (0.033)	-0.004 (0.020)
Education: high school	-0.004 (0.040)	-0.012 (0.055)	0.007 (0.053)	0.005 (0.032)
Trust in government	0.058 (0.040)	0.009 (0.055)	0.017 (0.043)	-0.003 (0.026)
Moral values	-0.067 (0.042)	-0.085* (0.051)	-0.034 (0.046)	-0.067** (0.034)
Control variables	Yes	Yes	Yes	Yes
Observations	1,131	1,131	1,131	1,131
R-squared			0.089	0.059
F-statistic	10.946	10.946		
Sargan test p-value	0.252	0.625		
Exog. Test p-value	0.002	0.061		

Note: All estimations include the same control variables as in Tables 2 and 3. The inclusion of further controls determines a reduction in the sample size due to missing values. Exogeneity test is rejected for “Benefits fraud” and “Tax evasion”; for these variables we report the corresponding IV estimates. Heteroskedasticity-consistent standard errors are in parentheses. \*\*\*, \*\*, \* denote significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

## -APPENDIX-

### A. Financial literacy questions

Each question also allows “Do not know” and “Would rather not say” as possible answers.

“Suppose you have 100 euros on a savings account and the interest is 2% per year.

How much do you think you will have on the savings account after five years, assuming that you leave all your money on this savings account?

- 1) more than 102 euros
- 2) exactly 102 euros
- 3) less than 102 euros

Suppose that the interest on your savings account is 1% per year and that inflation amounts to 2% per year. After 1 year, would you be able to buy more, exactly the same, or less than you could today with the money on that account?

- 1) more than today
- 2) the same as today
- 3) less than today

A share in a company usually offers a more certain return than an investment fund that only invests in shares.

- 1) true
- 2) not true

If the interest rate goes up, what should happen to bond prices?

- 1) they increase
- 2) they decrease
- 3) they stay the same
- 4) none of the above”

## B. Probit and IV probit

**Table B1.** Cheating related to shadow-economy activities

	Benefits fraud		Tax cheating	
	(1) (PROBIT)	(2) (IV PROBIT)	(3) (PROBIT)	(4) (IV PROBIT)
Financial situation	-0.016*** (0.005)	-0.373*** (0.133)	0.010 (0.008)	0.266** (0.117)
Love of money	0.033 (0.024)	0.168 (0.117)	0.096*** (0.035)	0.250*** (0.096)
General trust	-0.049*** (0.019)	-0.284*** (0.104)	-0.086*** (0.027)	-0.212*** (0.081)
Age: below 30	0.083 (0.053)	0.164 (0.226)	-0.055 (0.057)	0.004 (0.190)
Age: below 65	0.038 (0.027)	-0.073 (0.192)	-0.012 (0.039)	0.182 (0.154)
Female	-0.023 (0.020)	-0.138 (0.103)	-0.120*** (0.028)	-0.305*** (0.082)
Number of children	0.013 (0.010)	0.013 (0.057)	-0.002 (0.015)	0.041 (0.049)
Married	-0.013 (0.020)	0.103 (0.129)	-0.027 (0.029)	-0.206* (0.106)
High urban	0.001 (0.019)	-0.019 (0.101)	-0.057** (0.028)	-0.138* (0.081)
Employee	0.014 (0.023)	0.275* (0.152)	-0.018 (0.034)	-0.219* (0.128)
Self-employed	0.044 (0.060)	0.341 (0.270)	0.049 (0.081)	0.016 (0.234)
College	0.016 (0.033)	0.213 (0.174)	-0.017 (0.046)	-0.155 (0.145)
Risk averse	-0.029 (0.020)	-0.098 (0.106)	-0.034 (0.029)	-0.131 (0.085)
Observations	1,228	1,228	1,228	1,228
Log-likelihood	-450.943		-778.436	
Pseudo R-squared	0.047		0.036	
F-statistic		18.299		18.299
Sargan test p-value		0.496		0.528
Exogeneity test p-value		0.016		0.028

Note: this table reports the marginal effects of the regressors estimated through probit (Columns 1 and 3) and IV probit (Columns 2 and 4) models on cheating related to shadow-economy activities. \*\*\*, \*\*, \* denote significance at the 1 percent, 5 percent, and 10 percent levels.

**Table B2.** Small-scale cheating behavior

	Fare evasion		Stealing property	
	(1) (PROBIT)	(2) (IV PROBIT)	(3) (PROBIT)	(4) (IV PROBIT)
Financial situation	0.001 (0.008)	-0.037 (0.109)	-0.004 (0.005)	-0.158 (0.141)
Love of money	0.055* (0.033)	0.160* (0.093)	0.038* (0.021)	0.232* (0.121)
General trust	-0.093*** (0.026)	-0.278*** (0.079)	-0.047*** (0.016)	-0.328*** (0.114)
Age: below 30	0.216*** (0.063)	0.561*** (0.182)	0.092* (0.052)	0.387 (0.242)
Age: below 65	0.054 (0.038)	0.124 (0.149)	0.052** (0.022)	0.237 (0.206)
Female	0.010 (0.027)	0.026 (0.080)	-0.011 (0.017)	-0.085 (0.111)
Number of children	0.029** (0.014)	0.078* (0.046)	0.009 (0.008)	0.031 (0.060)
Married	-0.061** (0.028)	-0.155 (0.101)	0.018 (0.018)	0.192 (0.140)
High urban	0.035 (0.027)	0.100 (0.078)	0.009 (0.017)	0.050 (0.108)
Employee	0.087*** (0.033)	0.277** (0.122)	-0.007 (0.019)	0.049 (0.159)
Self-employed	0.061 (0.078)	0.192 (0.224)	-0.042 (0.032)	-0.262 (0.325)
College	0.073 (0.047)	0.225 (0.138)	0.035 (0.030)	0.264 (0.172)
Risk averse	-0.102*** (0.027)	-0.291*** (0.082)	-0.058*** (0.017)	-0.356*** (0.112)
Observations	1,228	1,228	1,228	1,228
Log-likelihood	-739.717		-353.079	
Pseudo R-squared	0.072		0.069	
F-statistic		18.299		18.299
Sargan test p-value		0.457		0.382
Exogeneity test p-value		0.711		0.345

Note: this table reports the marginal effects of the regressors estimated through probit (Columns 1 and 3) and IV probit (Columns 2 and 4) models on small-scale cheating behavior. \*\*\*, \*\*, \* denote significance at the 1 percent, 5 percent, and 10 percent levels.

**Table B3.** Small-scale cheating behavior, IV estimates

	Fare evasion (1) (IV)	Stealing property (2) (IV)
Financial situation	-0.015 (0.038)	-0.028 (0.026)
Love of money	0.058* (0.034)	0.044* (0.024)
General trust	-0.095*** (0.027)	-0.049*** (0.016)
Control variables	Yes	Yes
Observations	1,228	1,228
F-statistic	18.299	18.299
Sargan test p-value	0.486	0.269
Exogeneity test p-value	0.662	0.322

Note: Control variables are the same as reported in Table 3.

### C. Postestimation tests

First stage- dependent variable: financial situation				
<i>lit_basic_fac</i>	1.590*** (0.341)			
<i>lit_adv_fac</i>	0.849*** (0.191)			
Other regressors not reported				
	Benefits fraud	Tax evasion	Fare evasion	Stealing property
Exogeneity test p-value	0.013	0.021	0.662	0.322
Sargan test p-value	0.636	0.614	0.486	0.269
F-statistic first stage			18.299	

Both basic and advanced financial literacy positively and significantly affect financial situation; the F-statistics are above the value recommended to avoid the weak instruments problem (Staiger and Stock, 1997). For all our dependent variables, Sargan test indicates no rejection of instruments' validity. The exogeneity test is not rejected for small-scale cheating behavior (*fare evasion* and *stealing property*); however, when we consider cheating associated with shadow-economy activities (*benefits fraud* and *tax evasion*), we find evidence of the endogeneity of financial situation.

## D. Robustness checks

Control variables are the same as reported in Tables 2 and 3.

**Table D1.** IV estimates using binary instruments

	Benefits fraud (1) (IV)	Tax evasion (2) (IV)	Fare evasion (3) (IV)	Stealing property (4) (IV)
Financial situation	-0.111*** (0.038)	0.101** (0.047)	-0.021 (0.043)	-0.018 (0.027)
Love of money	0.041 (0.028)	0.093** (0.036)	0.058* (0.034)	0.044* (0.023)
General trust	-0.059*** (0.021)	-0.076*** (0.029)	-0.096*** (0.027)	-0.048*** (0.016)
Control variables	Yes	Yes	Yes	Yes
Observations	1,228	1,228	1,228	1,228
F-statistic	15.759	15.759	15.759	15.759
Sargan test p-value	0.9424	0.710	0.441	0.533
Exogeneity test p-value	0.005	0.035	0.587	0.591

**Table D2.** IV estimates using only basic financial knowledge as instrument for financial situation

	Benefits fraud (1) (IV)	Tax evasion (2) (IV)	Fare evasion (3) (IV)	Stealing property (4) (IV)
Financial situation	-0.077* (0.041)	0.109** (0.051)	0.006 (0.049)	-0.049 (0.035)
Love of money	0.039 (0.027)	0.092** (0.036)	0.057* (0.034)	0.045* (0.024)
General trust	-0.056*** (0.020)	-0.075** (0.030)	-0.093*** (0.027)	-0.052*** (0.017)
Control variables	Yes	Yes	Yes	Yes
Observations	1,228	1,228	1,228	1,228
F-statistic	19.940	20.527	19.895	19.603
Exogeneity test p-value	0.104	0.022	0.999	0.207

**Table D3.** OLS estimates including household income as an additional explanatory variable

	Benefits fraud (1) (OLS)	Tax evasion (2) (OLS)	Fare evasion (3) (OLS)	Stealing property (4) (OLS)
Financial situation	-0.014** (0.006)	0.010 (0.008)	0.003 (0.008)	-0.004 (0.004)
Love of money	0.040 (0.026)	0.099*** (0.035)	0.062* (0.034)	0.044* (0.024)
General trust	-0.051*** (0.019)	-0.088*** (0.027)	-0.096*** (0.026)	-0.047*** (0.016)
(log)income	-0.026* (0.015)	-0.005 (0.019)	-0.018 (0.019)	-0.001 (0.008)
Control variables	Yes	Yes	Yes	Yes
Observations	1,228	1,228	1,228	1,228

Note: Heteroskedasticity-consistent standard errors are in parentheses. When income is included in the specification we consider OLS rather than IV regression model as we cannot reject the null hypothesis of weak instruments.