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Does wealth reduce support for redistribution? Evidence from an Ethiopian housing lottery ☆

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ABSTRACT

Exploiting the variation in wealth created by an Ethiopian housing lottery, we show that general attitudes towards redistribution and inequality aversion are not affected by a large positive wealth shock. New homeowners are, however, less supportive of taxing homeowners, highlighting a potential conflict between self-interest and preferences for redistribution. We also find evidence of endogenous beliefs: relative to losers, the wealthier winners are less likely to emphasize the role of luck in explaining economic success. We interpret this finding in terms of a self-serving bias.

1. Introduction

The relationship between wealth and support for redistribution is a classic topic in the social sciences (Marx, 1859; Lipset, 1960; Downs, 1957). The correlation is generally negative (Alesina and Giuliano, 2011), but causal evidence remains scarce. This is not due to a lack of interest, which is evident from its prominence in theoretical models (Romer, 1975; Meltzer and Richard, 1981), but rather to the difficulty of finding plausibly exogenous variation in wealth. The nature of this relationship is increasingly relevant for low- and middle-income countries today. As these economies grow, and their citizens and political elites become wealthier, the potential impact on demand for redistribution may have an important bearing on the development of nascent welfare states.

From a classical economic viewpoint, individual support for redistribution reflects economic self-interest. According to this "*pocketbook*" perspective, better-off people should oppose redistribution, because they are more likely to have to pay for it. In reality, however, support for redistribution is also driven by inequality aversion and fairness considerations that may run counter to self-interest (Cappelen et al., 2007). Indeed, the respondents in our context voice overwhelming aversion to inequality, believe that inequality in Ethiopia is unfair, and support redistribution.[1] Moreover, people generally consider economic differences to be fairer and, hence, more acceptable, if they are the result of effort rather than luck or personal connections (Alesina and Giuliano, 2011; Alesina and Glaeser, 2004; Alesina and Angeletos, 2005; Alesina et al., 2018; Fong, 2001; Almås et al., 2020). Support for redistribution may, therefore, depend not only on self-interest and fairness considerations, but also on beliefs about the sources of inequality.

We provide evidence on the causal effects of material conditions on support for redistribution by studying winners and losers

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[1] Nearly all respondents agree that the Ethiopian government should aim at reducing inequality (99%), and that the economic differences between rich and poor in Ethiopia are unfair (98%). More generally, respondents believe that a fair society requires differences in living standards to be small (70%), and that it is the government's responsibility to reduce differences between rich and poor (81%).

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of an Ethiopian housing lottery. The lottery randomly allocates the right to purchase an apartment at a highly subsidized price, and winners experience a substantial increase in wealth. In contrast to other sources of variation in wealth, windfalls should not *directly* affect fundamental attitudes towards inequality.[2] On the other hand, winners should reduce their support for redistribution out of self-interest.

Our main finding is that winning the lottery does not affect fundamental attitudes towards redistribution or inequality acceptance, suggesting that such attitudes are rooted in deep and stable values. Winners are, however, less supportive of a specific redistributive policy that would affect them directly; namely a real estate tax. This is consistent with the pocketbook-perspective. We also find evidence of endogenous beliefs. In particular, we show that lottery winners are less likely than losers to attribute poverty to (bad) luck, even though the difference in economic resources between the two groups is entirely due to chance. This indicates that people may be subject to a *self-serving bias* (Zuckerman, 1979; Mezulis et al., 2004).[3]

To enhance the credibility of our findings, we replicate them using survey data from an earlier round of the lottery collected by Franklin (2019), which included similar questions. These data support the overall conclusion that general attitudes towards redistribution and inequality acceptance are unaffected by winning the lottery, and again we find that winners are less likely to believe that luck is important for economic success.

The fact that the observed changes in beliefs do not translate into a decreased support for redistribution might seem surprising. At least, that is what we would expect to see if preferences for redistribution were driven by meritocratic fairness views. While one could think of several potential explanations for this finding —including motivated reasoning or simply that changes in attitudes take longer to materialize than changes in beliefs— a more plausible explanation may be that the lottery participants we study simply do not hold such meritocratic views. Indeed, new global evidence suggest that people in non-Western countries (including Ethiopia) are not as meritocratic as people in richer countries (Almås et al., 2022). Hence, even though lottery winners are less likely to think that success is due to luck, we would not necessarily expect this belief to strongly influence inequality acceptance or support for redistribution in the context that we study.

Our findings contribute to the scarce literature on the causal effects of wealth and income on support for redistribution. To our knowledge, only two previous studies have investigated the effects of lottery-induced wealth on political attitudes or outcomes. Powdthavee and Oswald (2014) use self-reported data from the British Household Panel Survey to compare lottery winners before and after they win. They find that winners of larger amounts are less likely to vote for parties that favor redistribution. Doherty et al. (2006) exploit the variation in prizes among lottery winners in the US to show that winners of larger amounts are more hostile to estate taxes. They find no effects on support for redistribution, views on inequality, nor on the desire to expand the social safety net; however, the absence of such effects is unclear, because the small sample size (342 winners) does not permit the authors to reject either large or null effects.

Our study overcomes a key limitation of the previous lottery studies. They compare winners from different lotteries and lack information about how much people played before winning. It is, therefore, unclear if the winners of different amounts are drawn from the same distribution. By contrast, we compare randomly drawn winners and losers from the same lottery. Furthermore, given that roughly half of the city's population signed up for the lottery we study, the participants are probably more representative of the general population than is the case for most prize-lotteries. Finally, our investigation includes a wider set of outcomes on inequality acceptance, beliefs and support for redistribution, allowing us to investigate different aspects of the income-attitudes nexus.

Despite housings' large share of the total stock of wealth in most countries (Piketty and Zucman, 2014), there is even less work on the effect of this particular type of wealth. Using longitudinal data from the USA and the UK, as well as cross sectional data from 29 countries, Ansell (2014) shows that house ownership and higher housing prices are related to lower demand for redistribution.[4]

We also contribute to a literature documenting that beliefs may adjust endogenously to material conditions. This includes the study of Di Tella et al. (2007), who show that assignment of property rights to squatters increases pro-market beliefs, as well as recent evidence from the laboratory (Deffains et al., 2016; Durante et al., 2014; Molina et al., 2019). Our findings are also consistent with new evidence from a large-scale study implemented with a representative sample from the United States, showing that economic success has a causal effect on beliefs (Fehr and Vollmann, 2021). Motivated beliefs serve both psychological and functional needs (Bénabou and Tirole, 2016; Bénabou, 2015). In our case, winners may adjust beliefs to avoid identity conflicts or preserve internal consistency, and selective recall may make them understate the role of luck.

Finally, our paper contributes to a broader literature on the endogeneity of policy preferences and determinants of support for redistribution.[5] Importantly, the literature on support for redistribution and belief formation is so far based almost exclusively on samples from high-income, Western countries. It is, however, critical to provide evidence from low-income but fast-growing countries such as Ethiopia. Indeed, fast changes in economic conditions and income mobility in such countries could lead to significant transformations in the traditional support for public redistribution.

2. The lottery

The lottery we study is part of a large-scale urban planning policy labeled The Integrated Housing and Developing Programme (IHDP). This program oversees the construction and allocation of high-quality condominium apartments in Addis Ababa, Ethiopia. The apartments are sold at highly subsidized prices, and due to excess demand, purchase rights are allocated through a lottery. We describe the program in detail in Appendix A, but summarize some key features here.

[2] Several studies have exploited job or wage trajectories to study similar questions (e.g. Lind, 2010; Owens and Pedulla, 2013; Margalit, 2013; Brunner et al., 2011.

[3] This last result is only statistically significant at the 10 percent level when we account for multiple hypothesis testing.

[4] See Ansell (2019) for an overview of the literature on the importance of asset ownership, and in particular home ownership. Among conservative politicians there has been a hope that increased house ownership would induce more conservative voting. Indeed, such considerations appear to have underlain the promotion of the "ownership society" by the Thatcher-administration in the UK and the W. Bush-administration in the US (Ansell, 2019). Alpino (2018) further show that politicians (in this case Berlusconi) use housing tax reductions strategically to increase conservative voting in elections.

[5] See, for example, recent studies that have shown that preferences for redistribution may depend on culture (Alesina and Glaeser, 2004; Luttmer and Singhal, 2011), institutions (Alesina and Fuchs-Schündeln, 2007), experiences with or prospects for mobility (Alesina and La Ferrara, 2005; Alesina et al., 2018; Fisman et al., 2015; Fisman et al., 2020), inequality acceptance (Almås et al. (2010, 2011, 2022, 2001, 2015)), perceptions about inequality and relative position in society (Hvidberg et al., 2020; Kuziemko et al., 2015; Karadja et al., 2017; Hoy and Mager, 2021), beliefs about behavioral responses and economic effects (Ballard-Rosa et al., 2017; Cappelen et al., 2018), and actual experienced inequality, e.g. generated in lab experiments (Bechtel et al., 2018; Cassar and Klein, 2019).

We study the 11th round of the lottery which took place in 2016 and allocated the purchase rights for 12,027 apartments. Participants had all registered for a studio, one- or two-bedroom apartment when the program was introduced in 2005. Eligibility was based on three requirements: (i) having resided in Addis Ababa the previous six months; (ii) not owning any other house or lease land; and (iii) having opened a savings account at the Commercial Bank of Ethiopia (CBE) and deposited the required savings for at least 29 months.[6]

Because supply and demand vary across unit type, separate lotteries are held for each type. Within each lottery, quotas exist for women (30 percent), civil servants (20 percent), and people with physical disabilities (5 percent). All quotas were decided upon after registration but before the lottery draw.

Upon winning the lottery, prospective homeowners were required to make a 20 percent down payment before they could sign the contract and receive the keys to their apartment. Around 95 percent of the winners initially drawn were able to do this. They are free to rent out their apartment, but are not allowed to sell it within the first five years. Despite these rules, a small share (4 percent) of the winners in our sample, in fact, managed to sell the apartment. A majority of the apartments are either rented out (31 percent) or still empty (32 percent), while only 30 percent have actually moved into their apartment two years after the lottery.[7] Two percent answer other things, such as relatives living there for free or that they partly rent it out.

The Ethiopian housing lotteries are also the object of other studies: Franklin (2019) investigates how winners respond to the lottery and their willingness to move to their new homes, Andersen et al. (2022) document effects on life satisfaction and psychological well-being, and Kotsadam and Somville (2021) report how winning the lottery affects charitable giving.

3. Data

We sampled applicants who had registered in 2005 and were eligible for the 11th lottery in 2016. We disregarded applicants for three-bedroom apartments, because almost everyone in this group had already received an apartment by the time of sampling. As noted, there were special quotas for women, government employees and people with physical disabilities, so we needed to obtain information on these variables.

The Ethiopian Development Research Institute (EDRI) obtained two administrative lists from the Addis Ababa Housing Development and Administration Agency (AAHDAA), one for winners and one for losers. The list of winners contains information about apartment type, gender, and public sector employment at the time of the registration. It did not include information about physical disability status at registration, so we had to ask them about this during the survey.

The list of losers contains registrants who qualified for the 11th lottery, but did not win (and had not won in the 12th lottery either, cf. Appendix A). This list includes information about the type of apartment registrants applied for and about physical disability status. Gender could be inferred from the registrants' first names (and later confirmed during the interview) and employment status had to be obtained during the survey.

From these lists, we randomly sampled 2,200 losers and 2,200 winners with unique telephone numbers. Sampling was stratified by (assumed) gender within each apartment type, because the chances of winning differed across these variables.[8] We aggregated the samples of winners and losers, randomized the order, and created a new ID variable. The list sent to the data collection team contained only ID-numbers, names, and phone numbers. In this way, treatment status (winner or loser) was blinded for the enumerators and we avoid issues with confounding factors due to different timing and different enumerators. EDRI interviewed the sampled individuals by phone using the survey questionnaire developed by the research team. The survey took around 20 min to answer and the respondents were offered ETB 50 in compensation. The data collection team had been told to stop after around 3,000 completed interviews.

This sample size was set to ensure that we obtain precise enough estimates. For a continuous outcome, at the 0.05 level of significance, 3,000 observations allow us to detect an effect size of 0.1 standard deviations with a power of 0.8. For the binary outcomes, the power depends on the mean value in the control group. For the outcomes that we consider, the minimum detectable effect size varies between 0.036 and 0.051 percentage points, at the 0.05 level of significance and a power of 0.8. These ex-ante calculations do not take into account the potential gains in precision coming from the covariates.

In total, EDRI contacted 3,318 people and completed interviews with 3,049 individuals (1,485 winners and 1,564 losers). The response rate is, therefore, 92 percent. The share of people unwilling to be interviewed is significantly larger among winners than among losers. In Appendix F.1, we present the results from a pre-specified bounds analysis, and we show that our main results are robust to reasonable assumptions about the potential values of the missing observations.

3.1. Survey measures

Our main outcome variables are related to preferences for redistribution, beliefs about the causes of poverty, and inequality acceptance.

We measure the respondents' preferences for redistribution with two main variables. At a more general level, we ask whether they agree that *"In Ethiopia, the national government should aim to reduce the economic differences between the rich and the poor*". This question comes from Almås et al. (2022). We then ask more specifically if *"In Ethiopia, the national government should have taxes on people owning houses to reduce the economic differences between the rich and the poor*". Answers are given according to a four-point scale (from *Strongly disagree* to *Strongly agree*), and the variables are recoded into dummy variables by choosing the cutoff value that divides the losers sample into two groups of as equal size as possible. For the first question, this cutoff is between *Agree* and *Strongly agree*, with 73 percent (of the losers) falling into the latter category; for the housing tax question, the cutoff is between *Disagree* and *Agree*, with 60 percent agreeing to some extent. We later refer to these variables as "Redistribution (general)" and "Redistribution (housing)".

We measure the causes of poverty with the question *"Why, in your opinion, are there people in this country who live in need? Here are two opinions: Which comes closest to your view? 1. People are poor because of laziness and lack of will power. 2. People are poor because of an unfair society.*" We create a dummy variable, "Individual/Society", which equals one if people answer 1 and zero

[6] These criteria imply that the program targets relatively poor households but not the poorest. When we compare the wealth of the lottery participants to the Ethiopian population using an index based on questions about household assets, included both in our survey and in the latest Demographic and Health Survey (2016), we find that people enrolled in the lottery are indeed slightly poorer than the average household of Addis Ababa (a difference of 0.11 standard deviation in the wealth index), but richer than people in other urban areas.

[7] The main reason for leaving the flat empty is the lack of basic infrastructure such as water and electricity.

[8] We were unable to stratify by employment and disability status at registration, because this information was not available for both winners and losers before the interview.

if they answer 2. This variable comes from the World Values Survey (http://www.worldvaluessurvey.org). We also include measures used in Almås et al. (2020), where the respondent is asked to what extent the following factors cause people to become poor (to a small or to a large degree): competence, luck, poor character, effort, discrimination, lack of opportunities, poor family, poorly-educated parents, and lack of ambition. We group these factors in four categories, and construct one index per category: *luck*, *individual* (competence, poor character, effort, lack of ambition), *family* (poor family, poorly-educated parents) and society (discrimination, lack of opportunities). Each index is constructed as the average of the binary variables that compose the group (e.g. the *individual* index is equal to zero when the respondent thinks that none of the individual factors are important, it is equal to $\frac{1}{4}$ if the respondent said that one of the four individual factors are important, etc.). We present the results using the four categories in the main text. The effects on the disaggregated components are reported in Appendix L.

We create a measure of inequality acceptance based on the question: *"Which opinion about inequality comes closest to your view? 1. Large differences in people's incomes are acceptable to properly reward differences in talents and efforts. 2. For a society to be fair, differences in people's standard of living should be small."* We create a dummy variable, "Meritocratic/Egalitarian", which equals one if people answer 1 and zero if they answer 2. This variable is based on questions from the European Social Survey (www.europeansocialsurvey.org).

Finally, based on respondents' reported asset values (including real estate) and liabilities, we calculate their housing-related wealth and net wealth. People were also asked whether they are richer today than five years ago, whether they expect to be richer in five years from now, and whether they perceive themselves as richer, equally rich, or poorer than other Ethiopians (where we have grouped together *richer* and *equally rich*). Finally, we construct an asset index based on whether the households own a radio, TV, refrigerator, car, computer, tablet, satellite dish, smartphone, or an electric mitad (a common cooking appliance).

The measures described thus far come from the survey of participants from the 11th lottery. However, we also include evidence from the 10th lottery, using survey data collected by Franklin (2019). Indeed, this survey contains questions that are directly relevant to this paper and have not been reported elsewhere. Respondents were asked which of the following statements best represent their view (on a scale of 1 to 10 with 1 representing the first view and 10 the second):

- *"In the long run, hard work usually brings a better life."* vs. *"Hard work doesn't usually bring success, it's more a matter of luck and connections."*
- *"Incomes should be made more equal."* vs. *"We need larger income differences as incentives for individual effort."*

In addition, respondents were asked how much they agreed with the following statements:

- *"It is the government's responsibility to reduce differences between rich and poor"*
- *"The government should raise taxes to expand programs that help the poor"*

Finally, the survey asks respondents about the social class with which they most closely associate their parents and their own household.

We include these additional survey measures in the table with the main results as a way to further check the validity and the generality of our main findings on preferences for redistribution and beliefs about the causes of poverty. This replication analysis was not pre-registered.

3.2. Descriptive statistics and balance test

Table 1 presents descriptive statistics for the overall sample and for the winners and losers separately. We see that 49 percent of the final sample are winners. As regards the strata variables, 42 percent of the respondents are female, while the shares registered for a studio, a one-, and a two-bedroom apartment are 20, 54, and 26 percent, respectively. As we used these strata variables when sampling winners and losers to maximize similarity, we would expect them to be balanced across the two groups.[9] The shares of public servants and people with physical disabilities are, however, higher among winners (30 and 6 percent, respectively) than among losers (14 and 0 percent, respectively). We should expect differences with respect to these variables given the quotas for these groups. Because the information was not available for both winners and losers beforehand, we could not stratify sampling on these variables. We describe these issues in detail in Appendix F.2, where we also show that the coding choices have little consequence for the main results.

The mean age of respondents is around 43 years (which implies that they were on average 29–30 when they signed up in 2005), the most common religion is Ethiopian Orthodoxy (76 percent), the most common ethnic group is Amhara (37 percent), and the most common birth region is Addis Ababa (45 percent).

To check that winning is indeed random, we test for balance in the control variables across the winner and loser groups. We do this by regressing the "Winner" variable on the control variables described above while controlling for the strata fixed effects S_i (gender, government employment, disability, and apartment type). Based on the F-test (see note below Table 1) we reject the hypothesis that these variables jointly predict winning. In the Appendix, Table A.4, we also present t-tests for each variable, as well as the results from the multivariate estimation. While the F-test shows that there is balance in general, winners and losers differ on some variables. In Appendix F.2, we show that our results are quite insensitive to the inclusion of controls.

4. Empirical strategy and results

To test the effects of winning the lottery on individual *i*'s outcomes, we regress the outcome of interest Y_i on T_i, a dummy variable equal to one if the individual has won the lottery, while controlling for the set of strata covariates S_i (gender, government employee, disabled, and apartment type):

$$Y_i = \beta T_i + \theta S_i + \varepsilon_i \quad (1)$$

This is our main specification as explained in the pre-analysis plan. Nonetheless, we also show results where we include the full set of control variables, and we check whether using the post-double LASSO selection approach of Belloni et al. (2014) increases precision (Appendix F.3). To the extent that one is worried about imbalance, the LASSO selection approach is also helpful since it precisely selects those variables that are correlated with both treatment and the outcomes. As the randomization is at the individual level, we use robust standard errors without any clustering.

When discussing the mechanisms, in Table 3, we also estimate Eq. 1 where T_i is decomposed in three categories: winners who

[9] The share of females is slightly lower in the loser group (40 vs. 45 percent), because the gender variable was updated for losers based on the interview. If we instead use the gender inferred from the name (as used in the sampling), the female share is 44–45 percent for both groups.

Table 1
Descriptive statistics.

	Total		Winner		Loser	
	Mean	SD	Mean	SD	Mean	SD
Winner	0.49	(0.50)	1.00	(0.00)	0.00	(0.00)
Strata variables						
Female	0.42	(0.49)	0.45	(0.50)	0.40	(0.49)
Public servant	0.22	(0.41)	0.30	(0.46)	0.14	(0.34)
Disabled	0.03	(0.17)	0.06	(0.23)	0.00	(0.06)
Studio	0.20	(0.40)	0.20	(0.40)	0.19	(0.39)
One-bedroom	0.54	(0.50)	0.53	(0.50)	0.55	(0.50)
Two-bedroom	0.26	(0.44)	0.26	(0.44)	0.26	(0.44)
Other control variables						
Age	42.81	(9.60)	43.38	(9.66)	42.26	(9.52)
Orthodox	0.76	(0.43)	0.77	(0.42)	0.74	(0.44)
Protestant	0.12	(0.32)	0.12	(0.33)	0.11	(0.31)
Muslim	0.11	(0.32)	0.09	(0.29)	0.13	(0.34)
Amhara	0.37	(0.48)	0.38	(0.49)	0.37	(0.48)
Gurage	0.17	(0.37)	0.15	(0.35)	0.18	(0.39)
Oromo	0.16	(0.37)	0.16	(0.36)	0.17	(0.38)
Tigray	0.08	(0.28)	0.09	(0.29)	0.07	(0.26)
Born in Addis	0.45	(0.50)	0.42	(0.49)	0.49	(0.50)
Born in Amhara	0.18	(0.38)	0.19	(0.39)	0.16	(0.37)
Born in Oromia	0.15	(0.36)	0.16	(0.36)	0.14	(0.35)
Born in SNNP	0.14	(0.35)	0.14	(0.34)	0.14	(0.35)
Born in Tigray	0.06	(0.24)	0.08	(0.27)	0.05	(0.22)
Earnings 2005 (at reg.)	5.13	(3.19)	5.22	(3.18)	5.05	(3.20)
Earnings 2015	7.05	(3.03)	7.14	(3.02)	6.97	(3.04)
Partner earnings 2005 (at reg.)	0.92	(2.47)	0.92	(2.45)	0.93	(2.48)
Partner earnings 2015	1.57	(3.25)	1.61	(3.28)	1.54	(3.21)
Partner 2005 (at reg.)	0.32	(0.46)	0.31	(0.46)	0.32	(0.47)
Partner 2015	0.50	(0.50)	0.49	(0.50)	0.52	(0.50)
N	3049		1485		1564	

Notes: An F-test of whether all "Other control variables" jointly predict winning, after controlling for the strata variables, returned a value of 0.42 ($p = 0.52$). The earnings variables are measured as the inverse hyperbolic sine transformation of the monthly earnings in Ethiopian Birr.

moved into their new apartment, winners who did not move in and winners who sold the apartment. These decisions are taken after winning and are plausibly endogenous. We, therefore, do not give a causal interpretation of these estimates, but use the correlations in our discussion of the lottery's effects.

4.1. Effects of winning on wealth

As noted, we interpret the effects of winning the lottery in terms of a wealth effect. To substantiate this interpretation, we start by estimating the effect of winning the lottery on wealth.[10]

Fig. 1 shows kernel (Epanechnikov) density estimates of the (net) wealth distribution of the losers and winners at the time of the survey (two years after the lottery). Net wealth is the sum of housing wealth and savings in cash and in the bank minus debt. The winners are clearly wealthier than the losers. Their average net wealth is ETB 452,038 (USD 15,120), which is more than 20 times larger than the wealth of losers (ETB 20,406 or USD 682). The difference corresponds to around 15 years of the average earnings in our sample.

We further test the effects of winning the lottery on different sources of wealth, on incomes and on expenditures (Appendix F.3). Winning increases both housing wealth (defined as the respondent's expected selling price of any real-estate units owned) and net wealth. Winners also perceive themselves to be richer than five years ago (the estimated effect is 6.5 percentage points relative to a mean of 71 percent among the losers) and expect to become even richer over the next five years. Finally, a larger share of winners than losers perceive themselves to be as rich as or richer than Ethiopians in general (74 vs. 63 percent). This analysis suggests that winning the lottery has a substantial impact on self-assessed wealth and perceived economic position. We find no effects on the household assets index described above, which may take longer to materialize. The winners also report larger expenditures, with the increase in mortgage payments being larger than the reduction in rents. Their overall income, however, also increases, due to a sharp increase in rental income. The fact that expenditures increase more than incomes may imply that winners are more liquidity constrained.

A weakness of our net- and housing wealth measures is that they are missing for part of the sample. In particular, some respondents were unable to provide an estimate of the market value for their real estate, and some simply refused to report their wealth. In Appendix Table A.12, we calculate bounds on the lottery effects and show that the estimated wealth effects remain large and statistically significantly different from zero, even if we make very extreme assumptions about the values of the missing observations. The conclusions remain the same if we use the inverse hyperbolic sine transformation of wealth.

4.2. Main results

Having shown the substantial effect of winning on wealth, we now present the effects of winning on the main outcomes in Table 2. In panel A, we see no effect on attitudes toward redistribution in general. The coefficient is very close to zero and, using a 95 percent confidence interval, we can reject that the effect is larger than 0.036 in any direction. That is, we can reject that the winners where more than 3.3 percentage points (4.9 percent of the mean) more or less likely to strongly agree that the government should intervene to reduce inequality. Turning to a specific type of redistribution that is salient to winners of the housing lottery, i.e. whether there should be a tax on people owning houses, we find

[10] We have also reported this "first stage", the lottery's effect on wealth, in Andersen et al. (2022) and Kotsadam and Somville (2021).

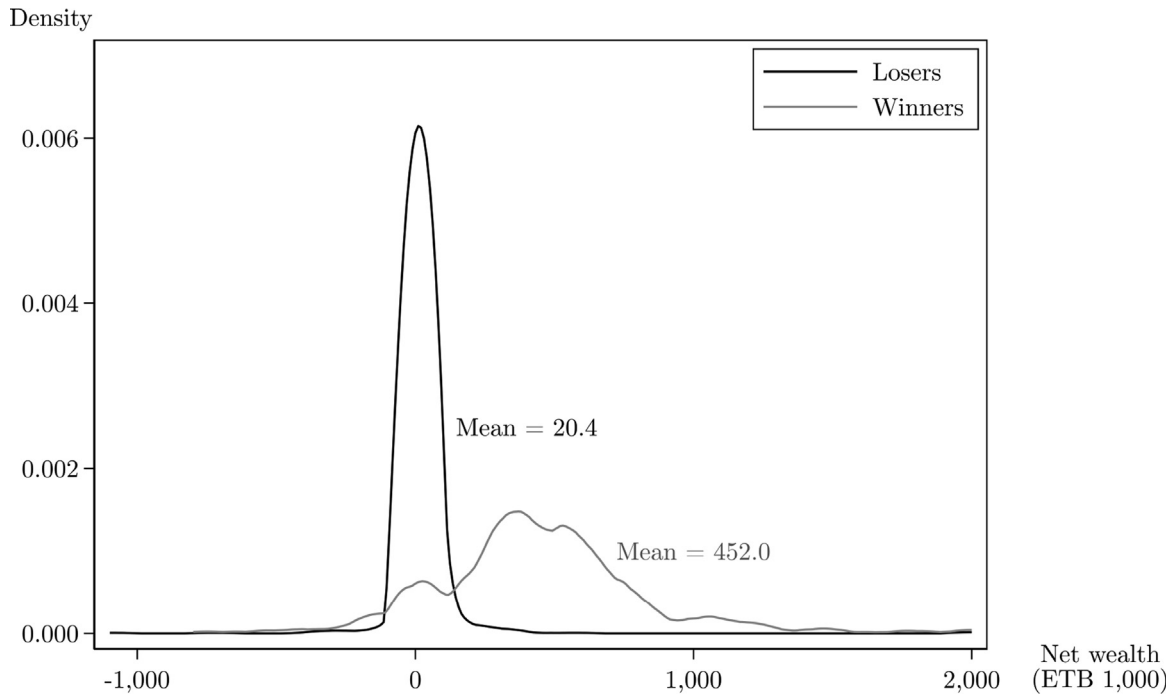

Fig. 1. Distribution of wealth among the lottery winners and losers. *Note:* The figure shows the distribution of wealth for winners and losers (in percentages).

Table 2
Lottery effects on the main outcomes.

	(1)	(2)	(3)	(4)
			A. Support for redistribution & Inequality aversion.	
	Redistribution General	Redistribution Housing	Causes of poverty Individual/Society	Inequality aversion Meritocratic/Egalitarian
Winner	−0.003	−0.038**	−0.002	−0.010
	(0.017)	(0.019)	(0.019)	(0.017)
Mean (losers)	0.734	0.600	0.489	0.312
N	3049	3049	3049	3049
			B. Beliefs about the causes of poverty.	
	Luck	Individual	Family	Society
Winner	−0.033**	0.008	−0.024	0.011
	(0.015)	(0.009)	(0.014)	(0.015)
Mean (losers)	0.208	0.730	0.232	0.776
N	3049	3049	3049	3049
			C. Results from the 10th lottery (agreement with statements).	
	Success is due to luck	Income differences are necessary	Government should reduce inequality	Raise taxes rightarrow help poor
Winner	−0.065**	0.003	−0.010	0.017
	(0.027)	(0.027)	(0.021)	(0.019)
Mean (losers)	0.449	0.447	0.190	0.131
N	1375	1375	1343	1336

Notes: The table reports the estimated effects of winning the lottery. Robust standard errors are in parentheses. We control for the lottery stratification variables in all Panels. P-values are $\leqslant 0.01^{***}$, $\leqslant 0.05^{**}$, and $\leqslant 0.1^{*}$.

a statistically significant negative effect. The point estimate shows that winners are 3.8 percentage points (6.3 percent of the mean) less likely to agree or strongly agree that taxing homeowners is a good idea. This suggests that, even though general support for redistribution is relatively stable, attitudes towards specific redistributive policies are, indeed, also driven by self-interest.

We find no effect on the variable measuring whether people ascribe poverty to an unfair society or to individual factors (Individual/Society), nor on the inequality acceptance measure (Meritocratic/Egalitarian). In Fig. 2 we show the distribution of attitudes across all possible responses, with comparisons between winners and losers, and we note that differences are generally small.

In Table 2, Panel B, we show effects on more detailed questions about the causes of poverty. We see that winners appear to be significantly less likely to attribute poverty to "bad luck". When we disaggregate the categories, we also see that they are more likely to ascribe poverty to a "poor character", one of the individual factors (Appendix Table A.63). These results suggest that beliefs appear to be subject to a self-serving bias.[11]

The fact that we find effects on the detailed questions about the causes of poverty but not on the main causes of poverty variable Individual/Society' may seem surprising at first sight. The Individual/Society variable is, however, silent on luck, and asks the respondent to compare and choose between *laziness* and *unfairness of society* as explanations. Respondents may think that both unfairness and laziness are important, in the same way as most respondents view both effort and discrimination, as well as opportunities

[11] In Appendix H, we show that the effect on Luck does not seem to mediate the reduced form effect we find of winning on attitudes.

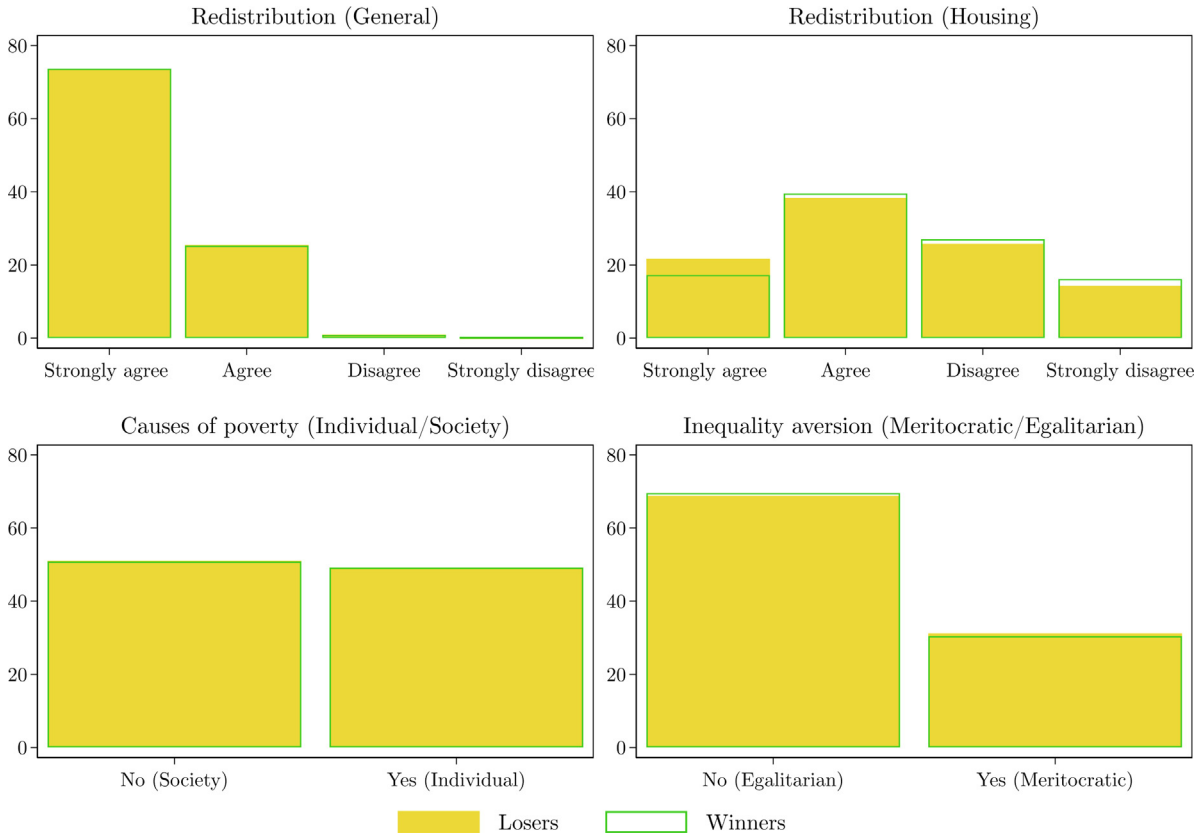

Fig. 2. Distribution of the answers for the main outcomes. *Note:* The figure shows the distribution of answers for the main outcome variables for winners and losers (in percentages).

and ambitions, as important causes of poverty (as seen in the mean values of the control group in Table A.63). Taken together, these findings suggest that winning leads people to believe that luck is less important in explaining poverty, whereas their relative weighting of laziness and fairness of society as explanatory factors does not change. It should also be noted that if we adjust the p-value for the effect on Luck for the fact that we are testing four hypotheses it is only statistically significant at the 10 percent level.[12]

We find more evidence corroborating our results on general attitudes and beliefs about the causes of poverty, using survey data from the 10th lottery in 2015, collected by Franklin (2019). This survey includes similar questions with a slightly different framing.[13] We show the effects of winning the lottery on these variables in Table 2, Panel C. Again, we see that winning the lottery makes people less likely to view luck as important for success. Indeed, winners are roughly 15% more likely to say that hard work, rather than luck, brings a better life.[14] There are no effects on broad measures of preferences for redistribution or taxation.[15]

We find further evidence in support of the self-justification effect. In the survey from the 10th lottery, respondents were also asked to report the class background of their parents, which obviously cannot be affected by the lottery. We find that winning the lottery leads respondents to significantly down-grade the class level with which they identify. In particular, they are more likely to identify as coming from the lowest social class. Our interpretation is that this type of selective recall creates a sense of entitlement that enables winners to exempt themselves from their own principles of fairness: they come from humble beginnings and, therefore, deserve to keep their newfound wealth (see Appendix Table A.58). Additionally, while most people do not perceive the lottery to be "fair and transparent", there is a large difference whereby 90 percent of losers and 61 percent of winners do not think so.[16]

5. Mechanisms and additional exploratory analysis

We have shown that winning the housing lottery increases people's wealth substantially, reduces their support for real estate taxes, and changes their beliefs about the causes of poverty. But these effects are not necessarily a result of the changes in wealth only.

Changes in wealth do not occur in isolation. When people become wealthier, they typically adapt their consumption: for instance, they may move to a nicer house in a better neighborhood (and this of course is even more likely in our case), they may make new friends and acquaintances, they may get access to new sources of information, and so on. Such changes in consumption

[12] Correcting the p-values for the fact that we are testing nine variables in the Appendix Table A.63, we note that only "poor character" is marginally statistically significant at conventional levels (p = 0.05).

[13] This data is from December 2017 to February 2018, around three years after the lottery.

[14] Specifically, winners are 15% more likely give a score of 1 or 2 on the scale from 1 to 10. The result is robust to discretizing the variable at other points in the scale, or looking at the raw response outcome. Figure A.4 in the appendix shows a leftward shift across the distribution of responses among winners.

[15] As seen in Appendix Tables A.57, these results are robust to adding additional household-level controls.

[16] The fact that we asked about fairness and transparency of the lottery in the same question makes the interpretation difficult. For instance, respondents may perceive the lottery to be fair but not transparent or vice versa. This may explain the relatively high share answering "No" to the question.

Table 3
Effects on main outcomes for winners with different post-lottery behavior.

	(1)	(2)	(3)	(4)
			A. Support for redistribution & Inequality aversion	
	Redistribution General	Redistribution Housing	Causes of poverty Individual/Society	Inequality aversion Meritocratic/Egalitarian
Movers	0.008	−0.074***	0.014	0.013
	(0.024)	(0.027)	(0.027)	(0.025)
Non-movers	−0.006	−0.035*	−0.011	−0.016
	(0.019)	(0.021)	(0.021)	(0.019)
Sellers	−0.020	0.141**	0.008	−0.074
	(0.058)	(0.058)	(0.066)	(0.055)
Mean (losers)	0.734	0.600	0.489	0.312
N	3049	3049	3049	3049
			B. Beliefs about the causes of poverty.	
	Luck	Individual	Family	Society
Movers	−0.034	0.008	−0.034*	−0.013
	(0.021)	(0.013)	(0.020)	(0.022)
Non-movers	−0.032*	0.005	−0.022	0.018
	(0.017)	(0.010)	(0.016)	(0.016)
Sellers	−0.050	0.052	0.020	0.063
	(0.048)	(0.032)	(0.054)	(0.045)
Mean (losers)	0.208	0.730	0.232	0.776
N	3049	3049	3049	3049

Notes: The table reports the estimated effects of winning the lottery, conditional on post-lottery behavior. Robust standard errors are in parentheses. We control for the stratification variables in all estimations. There are 438 Movers, 985 Non-movers, and 62 Sellers in the sample. P-values are $\leqslant 0.01^{***}$, $\leqslant 0.05^{**}$, and $\leqslant 0.1^{*}$.

could themselves have effects on preferences and beliefs. The observed effects may therefore be due to the immediate, direct effect of wealth, coupled with the indirect effects of wealth through changes in consumption or environment. It is difficult to know exactly what mechanisms underlie our results. Furthermore, it may be the case that winning the lottery has a direct effect on our outcomes, i.e. not via the effect on wealth. The most likely direct effect would be to move to better housing in another neighborhood. We investigate this the following section.

5.1. Movers, sellers, and non-movers

Moving to a new neighborhood is a possible mediator for the effects of wealth and studies of cash prize lotteries find that people often move when they become wealthier. In our sample, only around 30 percent of the winners moved to the apartment they won.[17] As moving is a choice, it is endogenous and we are unable to distinguish between the direct effects of winning and the effects of winning mediated by moving. We can, however, conduct some exploratory analysis and investigate the effects for those who moved to the apartment they won, those who still own it but have not moved in (including those who rent out the apartment), and those who have sold it.

In Table 3, we split the winners into these three groups. We find that sellers are more favorable of taxing homeowners. Note that there are only 62 sellers in the sample, however. For winners who have not sold the apartment, the effect estimates are negative and not statistically significantly different from each other ($p = 0.17$). We interpret these findings as a clear indication that people's attitudes towards redistribution may depend on the likelihood of having to pay for it themselves. The effects on the beliefs about the causes of poverty are also very similar in all three groups.[18] This analysis indicates the effects of winning the lottery are unlikely to be driven by moving or by exposure to a new neighborhood.

6. Conclusion

Are attitudes toward redistribution stable or are they endogenous to material conditions? This question has puzzled social scientists for centuries and we offer new evidence based on a large-scale, preregistered, data collection of randomly assigned winners and losers of an Ethiopian housing lottery. We verify that winners and losers are similar in terms of baseline characteristics and show that winning entails a large increase in wealth.

Our main findings lend support to both the pocketbook theory of attitudes and the ideology perspective. As regards the first, we find that winning the lottery reduces support for a specific redistributive policy that would affect winners directly; namely a real estate tax. In support of the latter perspective, we find no effects on more general attitudes toward redistribution and inequality acceptance. We further show that care should be taken when separating ideology and pocketbook, because beliefs that are often seen as more profound and ideological can be endogenous to material conditions. In particular, we uncovered important changes in beliefs about the causes of poverty: lottery winners are less likely to think luck plays a role for poverty (and more likely to ascribe it to a "poor character"). This finding is consistent with a self-serving bias but the result on luck is only statistically significant at the 10 percent level when we account for multiple hypothesis testing (see Appendix E for a discussion of how we pre-specified the multiple hypothesis testing corrections).

It is striking that the important observed changes in beliefs about the causes of poverty do not translate into more radical changes in support for redistribution. This is in line with recent evidence from the laboratory showing that changes in beliefs about the importance of luck and effort do not necessarily affect subsequent willingness to redistribute (Lobeck, 2021). It is also consistent with the recent finding that meritocratic views are much less prevalent in non-Western countries than in European and North-American societies (Almås et al., 2022). It could of course also be a matter of time, where beliefs change first and support for redistribution adapt later. But it may also be the case that distributional preferences are more stable than beliefs, as recently

[17] 24% of all respondents moved to any new place after the lottery: 12% of the losers and 37% of the winners.

[18] In Appendix K, we separate between non-movers who are renting out the apartment ("landlords") and other non-movers (i.e., cases where the flat is still empty or a relative is staying there for free). The results are not very different for these groups, but the landlords appear to be less hostile toward housing taxes. A possible explanation is that a larger share of the landlords expect to sell the apartment within some years.

discussed in Fisman et al. (2020). This question deserves further inquiry and it seems to be an important avenue for future research.

Because winning the lottery is random, conditional on the strata variables, and given that we only compare individuals who participated in the same lottery, the internal validity of our findings is strong. In addition, we are able to replicate our results using survey data from a previous round of the lottery. How well these results generalize to other settings and other types of wealth gains is an open question. The lottery we study is different from a cash prize lottery in several dimensions. Winners in the lottery not only become wealthier, they also get access to better housing in a new neighborhood. We show, however, that only a minority of the winners have moved, and that movers and non-movers have similar preferences. As winners are also making a down payment on their property and have to pay off their mortgage, it is possible that they are more liquidity constrained than the losers and this may also affect preferences. An additional feature of our setting is that being eligible for the lottery implies saving, which the participants may interpret as effort. Hence, the winners may think of their wealth as partly stemming from effort and not luck alone. Furthermore, absent longitudinal data it is difficult to completely rule out that our results could be driven by losing the lottery an additional time rather than winning. It is also important that our control group consists of people that have lost 11 times, which may have an independent effect on attitudes and beliefs via disappointment, especially if one assumes that winning once washes away the pain of the 10 previous losses. Finally, it is possible that wealth affects preferences more over a longer time horizon, and perhaps even across generations. We hope that future studies will investigate the effects of similar and different types of shocks in other settings so that we learn more about the general effects of wealth on attitudes and beliefs.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary material

Supplementary data associated with this article can be found, in the online version, at https://doi.org/10.1016/j.jpubeco.2023.104939.

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