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Benefits by Luck: A Study of Lotteries as a Selection Method for Government Programs

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Abstract

Lotteries could be a just and cost-effective procedure to distribute government benefits in contexts of oversubscription, with the added benefit of allowing assessments of the impact of government programs. However, little is known about whether there is public support for employing lotteries in this context. We examine support for a lottery that selects recipients of new government-built housing units in Brazil and find that neither lotteries participants nor the general public supports their use. We arrive at this result by employing a three-pronged multi-method approach. Quasi-experimental analysis of an original survey of lottery participants reveals that support not only is tepid, but substantially higher among winners than non-winners. In-depth interviews suggest that applicants believe lotteries miss the most deserving beneficiaries. A general population survey experiment reveals that lotteries are not perceived as just or efficient when compared to alternative

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beneficiary selection methods. While sometimes normatively desirable, the use of lotteries for government programs enjoys limited popular support.

Keywords
experimental research, latin american politics, public administration, social welfare programs

In one of its most popular definitions, politics is about "who gets what, when, how" (Lasswell, 1936). Making this determination, however, involves not only overtly political disputes over policy goals, but also less conspicuous decisions related to policy implementation. With respect to social policies, for example, policymakers must design mechanisms to determine which citizens will be eligible to receive a benefit, to select recipients in case there is more demand than supply, and to deliver benefits to citizens.

These decisions have potentially far-reaching consequences. Detailed targeting, particularly in low-capacity environments, can lead to over-burdening of bureaucracies and potential beneficiaries alike, effectively repressing benefits and underserving the most vulnerable populations (Heinrich, 2015; Hunter, 2019; Rich, 2023). Conversely, too much discretion at the street level can lead to uneven implementation and political favoritism, facilitating clientelism and unfair and inefficient allocation of benefits (Rizzo, 2020). Design and implementation problems, in either direction, might even reduce support for government programs.

The use of randomization (lotteries) for the selection of beneficiaries *could* play an important role in addressing these key concerns of the literature on policy implementation. Lotteries are an a priori just and practical selection mechanism in some contexts that could provide a relatively low-burden alternative for beneficiary selection, especially when demand is high and targeting capacity low, while abating concerns about street-level discretion and political favoritism. Furthermore, randomization is already used to allocate scarce resources across several policy domains and many more uses have been proposed (Stone, 2011, pp. 7–12). Perhaps surprisingly, empirical evidence on how the public evaluates lotteries is extremely rare across all fields, and all but absent from scholarly work on policy design and implementation (see Appendix A).

In this paper we attempt to begin filling this gap by examining how individuals directly affected, as well as the general public, assess the use of lotteries to select beneficiaries of government programs. We examine *Minha Casa, Minha Vida* (MCMV), a large housing program in Brazil that allocates newly built homes to low-income beneficiaries selected by lot.[1]

The lack of empirical assessments of the acceptability of lotteries is a particularly glaring gap given that support for many alternative methods of selection of beneficiaries, such as community-based selection, means-tested mechanisms, and even artificial intelligence algorithms (Devereux et al., 2017), has been evaluated. This gap is also intriguing if we consider that normative discussions about the use of lotteries in public decision-making span many fields of knowledge, including philosophy, law, and economics (Lavie, 2011, e.g.) and in medical ethics (Persad et al., 2009; Rosenbaum, 2020; Scheunemann & White, 2011, e.g.). Most of the few assessments that have been made fall in this last field and reveal that lotteries typically do not command much enthusiasm. Acceptance of randomization has also been probed within the debate surrounding the use of lotteries in randomized controlled trials (RCTs). This context differs from ours because in RCTs randomization is used for learning and evaluation purposes and not for allocating public resources, though wider use of randomization could help meet Campbell's (2012) call for more emphasis on causal identification in the study of policy feedback. Part of this literature finds that the public objects to randomization (Heck et al., 2020; Meyer et al., 2019a, Meyer et al., 2019b) while others finds no "experiment aversion" (Mislavsky et al., 2019, 2020; Mazar et al., 2023), but it is not obvious that the findings would generalize from one context to the other.

Learning about the opinions of those affected by public policy lotteries is important because lotteries are used or have been proposed in many different policy areas. Randomization is often a hard concept to understand, so the public might be more skeptical than scholars and policymakers and reject programs that include lotteries. Assessing the influence of policy design on support for government programs has a long tradition in the literature examining attitude formation about social policy (Jensen & Petersen, 2017).

For many citizens, receiving or attempting to receive a benefit is their most salient, first-hand experience with the state (Kruks-Wisner, 2018; Soss, 1999). Consequently, policy makers' and administrators' decisions regarding how to distribute government benefits shape attitudes (Heinrich, 2015; Kruks-Wisner, 2018), and involvement in politics (Sjoberg et al., 2017). Lotteries, in this context, *might* also affect the perceptions held by the general (non-eligible) public about the policy and the government.

This paper addresses our lack of knowledge of the public's evaluation of lotteries through a three-pronged approach. We i) survey MCMV lottery participants to examine the overall level of support as well as the differences in support for lotteries between winners and non-winners, ii) conduct in-depth qualitative interviews with lottery participants, and iii) field a survey experiment with a national sample of the citizenry regarding their views on lotteries vis-à-vis other methods of selecting beneficiaries.

Our original surveys reveal low support for lottery usage. By leveraging the quasi-experimental variation between lottery winners and non-winners we were also able to spot significant disparities in support for the lotteries. Our in-depth interviews indicate that participants resent that the lottery is being blind both to the "need" of applicants and to their "ability" to become "suitable" homeowners. Participants also dislike the unpredictability of not knowing if and when they might eventually be selected, suggesting that additional targeting or outright queuing would be preferable to them. When we then evaluate these insights within the general population using a pre-registered survey experiment conducted with a nationally representative sample, we find that lotteries are perceived as both less fair and less efficient than selection by need or by queueing, that they appear to diminish overall support for the program, and that lotteries have only a marginal benign effect on perceptions of political manipulation. In summary, randomization, even when perceived as unbiased, lacks public approval, and the existing support seems to stem from self-serving reasoning, as it arises from being randomly chosen as a recipient.

We proceed as follows. We start, in Section 1, by reviewing normative arguments and the few empirical results regarding the use of lotteries in public policies. In Section 2 we describe the MCMV program and its lotteries and in Section 3 we state our guiding hypotheses. We then describe our quasi-experimental analysis and its results in Section 4, examine our in-depth interviews in Section 5, and our survey experiment in Section 6. The final section summarizes findings and discusses their implications.

The Views on Lotteries as a Selection Mechanism

For many government programs, demand outstrips supply, even after eligibility criteria are taken into account. For example, conditional cash transfer programs have wait-lists when eligible families are unable to receive benefits due to governments budgetary or administrative constraints. School vouchers, daycare spots, and specialized medical treatments are also notable examples of government programs that often find themselves unable to accommodate all eligible beneficiaries. Consequently, policymakers and bureaucrats often must resort to additional procedures to select recipients.

While one could fine-tune eligibility criteria further, precise targeting requires collecting and processing more information about prospective beneficiaries. Such collection is not always technically or politically feasible and imposes burdens on applicants and administrators alike. Public officials' time and energy might be consumed by organizing citizen-facing interfaces, processing, and validating information, and diverting resources from the end goal of the program. From citizens' perspective, more precise targeting can impose requirements they cannot meet even when they are in fact eligible and

may also function as symbolic barriers to access (Heinrich et al., 2022; Moynihan et al., 2014; Van Oorschot, 2002).

When is the Use of Lotteries Normatively Justifiable?

We are interested in the use of lotteries in a context in which the pool of applicants to a social program has been wound down to roughly equivalent candidates. Lotteries, however, are and have been used in public affairs not only to allocate goods (Kahneman et al., 1986; Lavie, 2011; Taylor et al., 2003; Vong, 2020), but also to assign responsibilities such as holding public office (sortition) (Manin, 1997), and, more recently, as a learning tool employed in the context of RCTs (Imbens & Rubin, 2015).

Sortition has probably received the most academic attention, at least in political science and political philosophy. It also illustrates well the contradictory nature of lotteries. While picking a president – or any high public officer – by lot would seem like an aberration, breaking an electoral tie would probably seem less so and choosing jurors at random from the population seems reasonable to most people, even if it is not enthusiastically endorsed by anyone. The normative literature has pointed out similar tensions in more common uses of lotteries for distributing goods and burdens.

Because of these tensions, most of the normative literature that debates the use of lotteries in public affairs gravitates towards assembling lists of their positive and negative features and uses (Stone, 2011, pp. 14–16). Few authors have attempted a general theory of when lotteries should be employed.

Recent theoretical work on lotteries has made more general claims that can guide our empirical evaluation of lotteries. Dowlen (2009) identifies *arationality* as lotteries' main feature; lotteries provide a "blind break" between the options available and the choice that is made, making them immune to rationality. Bagg (2024) makes a similar argument, emphasizing lotteries' blindness to efforts made by those attempting to secure public office is precisely what gives sortition its capacity to obstruct elite capture and prevent corruption. Hence, whenever such a break is desirable and needed, lotteries are appropriate. Whenever such a break is not needed or desired, such as when there are other reasonable ways to differentiate between claimants, lotteries are not justified. Stone (2011) offers probably the most comprehensive analysis and the most cogent and general enunciation of the promise and limits of the use of lotteries. In his account, lotteries "prevent decisions from being made on the basis of reasons" and this gives lotteries a "sanitizing effect" (p. 16). For Stone, the long list of positive and negative aspects of lotteries that have been identified over centuries can all be synthesized in the following abstract rules: "If there are no good reasons for making a decision, and potentially bad reasons, then lotteries (or some other sanitizing procedure) are desirable for good decision-making. If there are good reasons, and no danger

of bad reasons, then lotteries are undesirable. If there are potentially both good and bad reasons, then lotteries may be desirable or undesirable, depending upon the seriousness of the risks and rewards involved. If there are neither good nor bad reasons, then lotteries are acceptable but serve no positive purpose." (Stone, 2011, p. 145).

We deduce, from this discussion, that even for normative scholars, the allocation of publicly built housing units to low income individuals is a an ambiguous setup in which to evaluate the use of lotteries. There might be good reasons to choose beneficiaries intentionally, such as finding the most suitable (efficiency) or the most needy (justness) among the eligible. There are also several bad reasons, such as officials choosing friends, supporters, or those willing and able to pay a bribe. The salience and likelihood of these alternatives should guides the normative choice to rely or not on a lottery. To a large extent, this depends on whether potential beneficiaries to been chosen by lot are, indeed, equivalent and/or whether it is possible or viable (cost-effective) to resolve the indeterminacy of the claims of applicants in order to target the goods or burdens in a more efficient manner.

How Does the Public Evaluate Lotteries?

It is unlikely that the public will engage in such profound considerations, so the level of support for lotteries remains an empirical question. For starters, while scholars debate the merits of fair lotteries, whether a lottery is fair or not might be a fraught issue among the public. "Randomness is an unobservable property of a generating process" (Bar-Hillel & Wagenaar, 1991, p. 429), so it is not straightforward to determine how fair a lottery is (Elster, 1989; Fienberg, 1971; Kahneman & Tversky, 1972). Fairness can only be assessed by evaluating the randomizing mechanism, which is not always trivial for the lay public. Hence, in an environment of low trust in which lotteries' sanitizing effect (or the blind break they provide) would be most welcome in making public decisions, it will also be hard for individuals to trust that the lottery procedure is fair.

Actual empirical assessments of the public's opinions about lotteries are fairly rare, and those of real world lotteries are even rarer. A few studies have examined the layman's perceptions about lotteries vis-à-vis other methods of allocating scarce medical resources (Grover, McClelland and Adrian 2020; Krütli et al., 2016; Snowdon et al., 1997). Lotteries ranked very low in the public's view in these studies, but this is not entirely surprising given that egalitarianism, one of the main draws of lotteries, is generally not very appealing in this field (Persad et al., 2009; Scheunemann & White, 2011, e.g.). Some also note an asymmetry in intensity of views about lotteries: those who supported randomization did so unenthusiastically, while those who rejected it did so forcefully based on perceptions that it was cruel and unjust.

There also exists lively debate about the topic of "experiment aversion." This literature has sought to determine whether individuals object to the use of randomized studies to choose policy alternatives and, by implication, whether they find randomized, controlled, experimentation intrinsically unacceptable. On the one hand, part of the literature suggests individuals disapprove of randomized studies even when impact of the policy alternatives is untested (Heck et al., 2020; Meyer et al., 2019a, Meyer et al., 2019b). On the other hand, another set of studies (Mislavsky et al., 2019, 2020; Mazar et al., 2023) finds no evidence of experiment aversion. None, however, find enthusiasm for randomization.

Outside of the medical field and beyond RCTs, Frey and Oberholzer-Gee (1996) found that lotteries were poorly ranked by Swiss citizens as a hypothetical mechanism to select nuclear waste disposal sites among similarly suitable localities. Jacquet et al. (2022) found Belgian politicians to be strongly opposed to sortition while the general public is somewhat less so; support is higher among disaffected individuals with a lower social status. More generally, Keren and Teigen (2010) show experimental evidence that people are reluctant to use randomization to decide "very important matters."

As for actual real world lotteries, we know there has been push back against a lottery system to select students for medical school in the Netherlands (ten Cate, 2021) and judges who used coin tosses to settle cases have been reprimanded (Keren & Teigen, 2010). Perhaps the closest analogue to our paper is an examination of applicants' perceptions of the use of a lottery by the Health Research Council of New Zealand to allocate research grants (Liu et al., 2020). This research showed that 63% of survey respondents found the lottery an "acceptable" allocation method for "explorer" grants (open, initial, and innovative), but only 40% considered it acceptable for other types of grants. The study also found that winners were more likely to support the lottery by a relatively wide margin (78%–44%), suggesting that when evaluating lotteries, even well-informed scientists are guided by outcomes and not by principle.

Despite these few works, we still know less about how citizens perceive the millennia-old mechanism of allocation of public services and goods through lotteries than about how they perceive much more recent sophisticated artificial intelligence algorithms in public policy, whose acceptance, recent studies show, is influenced by factors such as perceived bias and transparency (Kennedy et al., 2022; Schiff et al., 2021). Based on these arguments and findings, how do we anticipate the public evaluate the MCMV lotteries? The next section provides contextual and institutional details important for this assessment, after which we state the hypotheses to be tested in the rest of the paper.

The MCMV Lotteries

The MCMV program, one of the largest public housing programs in the world, was created in 2009 and by 2017 it had delivered 3.1 million new units. The lowest eligibility income tier, known as Tier 1, was geared toward non-homeowning families with monthly income up to R$1800 and accounted for more than one-third of the delivered units. The general guidelines for the selection of Tier 1 beneficiaries were modified a few times over the years,[2] but the program has always required that Tier 1 applicants enroll with their local government, that a certain number of the units be reserved for a few priority categories, and that the local governments select beneficiaries by a lottery that is announced in advance and publicly accessible.

Individuals selected in the lottery were screened by their local government and the *Caixa Econômica Federal* (CEF) – the federal mortgage bank that finances the program. Those who were deemed eligible were offered a 120-month contract with installments that varied from R$80 to R$270, depending *solely* on their income; subsidies could reach 90% of the value of the home. Although program beneficiaries were "borrowers" until they finish paying their installments, Tier 1 terms were generous to the point of being an outright gift.

Within these general guidelines, the beneficiary selection process varied considerably across municipalities. We focus on the MCMV as implemented in the municipality of Rio de Janeiro (population $\sim$ 6.5 million), one of the first to participate in the program. Twenty-three "general public" city-wide lotteries for Tier 1 units took place in Rio between 2009 and 2017. Administrative records published prior to each drawing indicate that a total of 712885 individuals participated in at least one of Rio's MCMV lotteries. As of August 2017, a total of 44711 individuals had been selected as beneficiaries and as of April 2017, 28562 housing units had been delivered.

Another advantage of examining the MCMV in Rio is that instead of staging its own lottery, the city government piggybacked on the Brazilian Federal Lottery (*Loteria Federal*). This lottery has been continuously drawn since 1962 under the auspices of the CEF, so it is well known and highly credible. Two drawings per week are held in venues open to the public, following an itinerary and schedule that is published in advance. The lottery currently uses five acrylic transparent globes, each populated with ten colored number balls. In each drawing, five 5-digit numbers are selected, referred to as first to fifth prizes.

The city government issues a formal call for the MCMV lottery whenever a housing project is nearing completion. All applicants on the program's applicant roll on the day in which the call was published in the official gazette were ordered alphabetically and received a sequential number valid only for a specific upcoming drawing of the *Loteria Federal*. The complete list of

applicants, including names, tax identification number (CPF), and the sequential drawing numbers were also published alongside the call, and made available online. The rules for determining MCMV winners varied somewhat across calls, mostly due to the number of units available (Appendix B). In all cases, participants whose numbers contained digits that matched lottery numbers were considered winners. Calls held in 2016 also instituted age as a tie-breaker; all applicants pre-selected based on their enrollment numbers were ordered by age, from oldest to youngest, and if there were more winners than units, the oldest were prioritized.[3]

The lottery is only one step in a fairly complex selection process that includes validation of applicants and eligible winners. Therefore, "hidden" exclusion of individuals could exist. However, the lottery process itself was quite transparent and neither we nor others who have examined the MCMV lotteries found evidence of fraud. Bueno (2021) and Pucci and Tavares (2023), for instance, fail to find evidence that politically-connected individuals are more likely to benefit from MCMV. Using administrative data, Chagas and Rocha (2019) and Souza (2019) also fail to find systematic differences between winners and non-winners on pre-treatment covariates, consistent with the claim that the lotteries were implemented fairly. Our own survey shows that very few subjects find out about the program or sign up for the lotteries via political brokers or even require assistance from anyone to sign up or sign the agreements, if selected. Furthermore, a national audit found that fewer than 1% of selected beneficiaries nationwide did not comply with the program's eligibility criteria (Controladoria Geral da União, 2016). While no program is free from fraud, this evidence is consistent with a program that does not contain high degrees of manipulation in the selection of beneficiaries. Also, importantly for our purposes, the process makes the Rio MCMV lotteries *visibly* fair.

Hypotheses

Normative scholars find reasons to support the use of lotteries in many settings but none of the few instances in which public opinion has been empirically assessed uncovered much enthusiasm. Furthermore, the thin evidence that exists also hints at the possibility that individuals might evaluate lotteries based on realized outcomes (who is selected) rather than on its procedures or adequacy to the task. This "consequentialist" approach is inconsistent with the features highlighted in normative discussions regarding lotteries' fairness and can detract from its support among non-winners.

Theory recommends fair lotteries whenever the arationality they imply (or the clean break or sanitizing effect depending on the author) is desirable. Following the lottery principle, however, this arationality would be desirable as long as indeterminacy about the strength of the claims of those involved

holds. We expect this "if-then" clause to be the main driver of support, but we do not know ex-ante how the public regards the equivalence of claims of those that fit the eligibility criteria for winning an MCMV home. Given that the initial eligibility criteria might not have been particularly salient to those who participated in the lottery or perhaps, even if individuals are well-informed about the eligibility criteria, they might have not consider all participants equally deserving because deservingness could depend on multiple dimensions besides the socioeconomic eligibility criteria in the policy. Hence we do not expect the lottery to command much support as few would support the use of lotteries to allocate goods to a very heterogeneous public – see Stone (2011, p. 149) and Elster (1989, p. 67). For these reasons, expect to find that:

Hypothesis 1. *Support for the MCMV lotteries among non-winners of the lottery is low.*

As detailed in the next section, we assess this hypothesis in contrast to how lottery participants evaluate other features of the MCMV program. In other words, support for these other features serve a benchmark for support for the lotteries.

A second question is whether individuals make principled evaluations of the use of a lottery that affects them directly. If principled decisions are made, whatever level of support we see in the data should be the same regardless of whether MCMV applicants won the lottery or not. If, in contrast, lottery winners support the lottery in higher numbers, it would be evidence that applicants evaluate the lottery based on the outcome, in a consequentialist as opposed to a principled decision. Such an outcome has strong implications for the capacity of lotteries to generate buy-in from those not selected. Given the previous results from Liu et al. (2020), we expect that:

Hypothesis 2. *Support for the MCMV lotteries will be higher among lottery winners than non-winners.*

While *we* are interested in the support for the use of lotteries, we concede that it is not obvious that the public's overall evaluation of government programs would be affected by the selection method employed. Regardless of how the public evaluates the selection method, the overall evaluation of a government program might depend more on attributes such as program goals, costs, or the identity of beneficiaries. Hence, we expect that:

Hypothesis 3. *The method of selecting from applicants does not affect the overall evaluation of government programs.*

Given the (few) empirical results that exist, we expect that the general public will also not be particularly fond of lotteries. Hence, in addition testing H1, which focuses on lottery participants, we also we hypothesize that

Hypothesis 4. *The general public believes that lotteries are less just than alternatives ways to select beneficiaries for government programs,*

and that

Hypothesis 5. *The general public believes that lotteries are less efficient than alternative ways to select beneficiaries for government programs.*

Finally, we expect that lotteries will perform better than alternatives with respect to limiting political favoritism. That is, even though we do not expect lotteries to be particularly liked, their "sanitizing effect" should be visible and understandable to the public:

Hypothesis 6. *The public believes that lotteries limit political favoritism in the selection of beneficiaries for government programs.*

We evaluate the first two of these hypotheses, as detailed in section 4, by surveying participants in actual MCMV lotteries. For the sake of transparency, we note that the first hypothesis was not pre-registered and that the second runs opposite of what we expected to find at the start of the project (see the observational study's PAP, in Appendix P). Reversing our original expectation, however, greatly facilitates the presentation of our follow-up studies and results, and is in line with results from the few other empirical assessments of lotteries.

In order to explore the rationale of participant's assessments of lotteries and to circumvent the consequentialist logic that we expect them to apply, we assess our remaining hypotheses through a separate survey experiment in which we asked a representative sample of the Brazilian population to evaluate a hypothetical housing lottery. These hypotheses are as preregistered (see the experimental study's PAP, in Appendix P) and the experimental study through which they are assessed is detailed in section 6.

What Do MCMV Applicants Think of the Lotteries?

We first examine data from two surveys of participants in four general MCMV lotteries in Rio de Janeiro in order to assess H1 and H2. A total of 683015 individuals participated in at least one of these lotteries that allocated apartment units of similar quality in newly built multi-building projects.

We surveyed 2914 individuals for the project. Between May 2017 and January 2018, we surveyed participants in two lotteries held in the second half of 2016 for which no housing unit had yet been delivered. The other survey,

carried out between December 2019 and January 2020, interviewed participants in two of the earliest general lotteries that were held in mid-2011 and whose housing units were delivered in 2012 and 2013.

For each survey, we first generated a large "pre-sample" that included *all* lottery winners and a larger random subset of non-winners. The size of this pre-sample of non-winners was selected so we could interview the effective sample size in the pre-analysis plan while generating a sample with comparable numbers of winners and non-winners. Interviews were conducted by phone.

We conducted a series of balance tests to assess the assumption that winners are similar to non-winners in our sample with respect to age, sex, race, having registered for welfare, years in formal employment, and average wages in both surveys and also religion, number of children, and years of schooling that are plausibly pre-treatment in the recent lotteries survey but not in the early lotteries survey. As reported in Appendix F, these tests did not indicate meaningful systematic pre-treatment differences between the two groups based on the joint hypotheses tests of regressions of these pre-treatment covariates on treatment assignment.[4] Another important concern for the analysis of survey data is attrition. Refusal rates were relatively low but we had high rates of non-response because we were unable to find many respondents (as was City Hall)[5], but as detailed in Appendix C, we took exhaustive measures to contact respondents and we also sought to minimize the possibility that we could induce different response rates between winners and non-winners by making our enumerators blind to treatment and by randomly determining the order of contact. Moreover, we did not find a difference in attrition rates between winners and non-winners (see Appendix G), which is consistent with other studies using MCMV administrative data (Chagas & Rocha, 2019; Souza, 2019).

Outcomes of Interest

In this paper, we examine a subset of the outcomes listed in our pre-analysis plan (PAP; see Appendix P). The main outcome of interest – for both H1 and H2 – is the answer to a question included in both surveys, which asked "Would you say that lotteries are a just way to select participants for the MCMV program?" We also examine outcomes related to the overall evaluation of the program, namely whether respondents agree that MCMV improved the lives of the population (a retrospective evaluation), that MCMV provides hope for a better life (a prospective evaluation), and that homeownership is a dream (an evaluation of the program's goals). These serve as the benchmark for the absolute level of support for lotteries (H1) and also allow us to assess the extent to which winning the lottery affects participants' perceptions of different aspects of the program, such as the program's overall evaluation and its objective.

Table 1. MCMV Survey Outcomes.

Outcome	Description	Orig. Scale
Goals	Some people say that homeownership is a dream; that it changes people's lives. Do you agree?	5-Point
Retrospective eval	Do you think that MCMV improved the lives of beneficiaries?	5-Point
Prospective eval	Would you say that MCMV brings families hope of a better life?	2-Point
Lottery is just	Would you say that the lottery is a just way to select beneficiaries of the MCMV program?	5-Point

Notes: Summary statistics and the full distribution of the variables are provided in Tables D1 and D2. For recoding from 5-point to binary variables, the highest two categories were coded as 1.

Table 1 lists the outcomes examined and the wording of the survey questions on which they are based (see Appendix E for the Portuguese version). In order to facilitate comparisons and interpretation across outcomes, we recoded outcomes to binary variables that take on the value of one when the evaluation was positive.

Estimation

The assessment of H1 relies on a simple comparison across the four outcomes of interest as measured among non-winners in our sample.[6] Assessment of H2 is more complex, and relies on comparisons between lottery winners and non-winners. Here our analysis largely follows our pre-analysis plan. Each lottery j was independent from the others and random assignment to treatment takes place within each lottery.[7] However, applicants i to each lottery often participated in multiple lotteries. Each of our surveys pools participants in two lotteries which took place weeks apart. Since we have survey respondents who participated in both lotteries included in each survey, our unit of analysis is an applicant-lottery ij and the assignment to treatment variable is the indicator for whether an applicant i won a lottery j.

To account for the unequal probabilities of assignment to treatment in each lottery, we include lottery fixed effects and use equation (1) to estimate intent-to-treat effects of winning the lottery,

$$Y_i = \beta_1 Z_{ij} + \beta_2 \mathbf{X}_i + \gamma_j + u_{ij}, \tag{1}$$

where $Z_{ij} = 1$ represents a winning applicant i in lottery j and $Z_{ij} = 0$ and $Z_{ij} = 0$ a non-winning one. The coefficient β_1 represents the effect of winning a lottery on Y_i, which is an outcome measure for an applicant i. $\mathbf{X}_i$ is a matrix of pretreatment covariates mentioned in the preceding balance discussion.

Estimates are largely robust to the exclusion of controls. The vector γ_j represents the lottery fixed effects and u_{ij} is the error term. In both specifications, standard errors are heteroskedasticity-robust clustered at the applicant level. In the recent lotteries survey, we include survey weights to correct for endogenous sampling (Solon et al., 2015), which are discussed further in Appendix C.

As a robustness check, we report in Appendix J specifications that include interactions between the treatment indicator with de-meaned fixed effects and control variables (Lin, 2013), and for the early lotteries survey we also show results using inverse probability weights. Results obtained are all but identical to the ones we report below. We also report complier average treatment effects, estimated instrumenting for whether a beneficiary actually knew about the result of the lottery in the recent lotteries survey and whether they accepted a MCMV housing unit in the early lottery survey (Appendix K).

Results

Figure 1 reports the average values for each outcome in our samples (values in gray circles) as well as the ITT estimates of the effects of being selected as a beneficiary on each outcome, for each of our surveys. The data indicate clearly that the program goals are worthy. Almost all MCMV lotteries participants supported the program's goals, by agreeing with the statement that "homeownership is a dream" (0.96 and 0.9, respectively), with no differences between lottery winners and non-winners in this regard. This is compatible with previous research that has revealed that the MCMV is popular among the general population and non-beneficiaries; even more popular, perhaps, than among beneficiaries (Bueno et al., 2022, 2023). These results suggest that part of the MCMV's political appeal is derived from the fact that housing, and homeownership in particular, are coveted by a huge majority of the population.

Retrospective and prospective evaluations are also very positive. The vast majority considered that MCMV "improved the lives" of beneficiaries (0.83 in both waves), and an even larger share thought that the MCMV "brought hope of a better life" (0.95 in both waves). Yet in the midst of this generally positive outlook on the program, it is striking to find only lukewarm support for allocating units via lottery. In fact, support for the lottery is the only outcome examined here that is not supported by a majority in either survey (0.45 and 0.39). These results support H1.

Furthermore, evaluations of the lottery are also much more polarizing than the other outcomes. Examination of the outcomes on their original scale shows that approval of the lottery has a clear bimodal distribution, with fewer than 10% of respondents picking the middle/neutral category (see Appendix H).

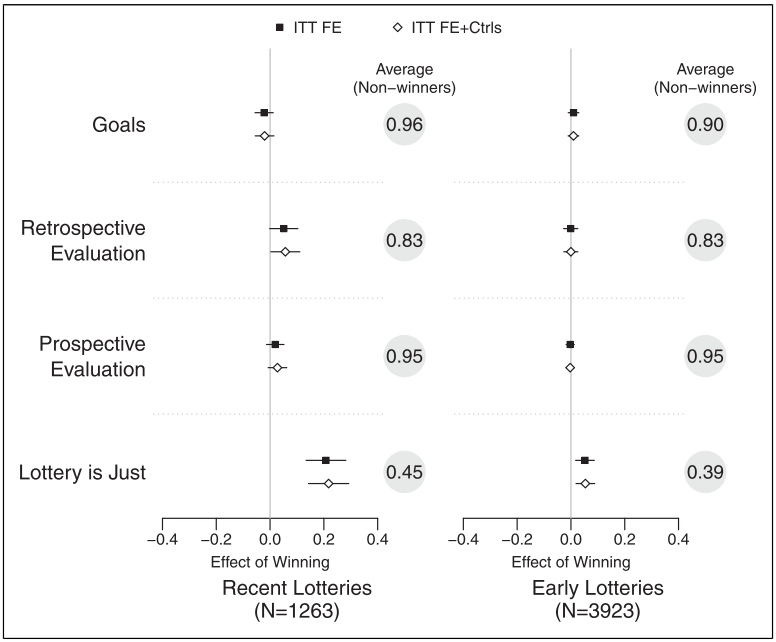

Figure 1. Results from MCMV surveys: Numbers inside the gray bubbles indicate the average level of support among non-winners. Dots report intent-to-treat effects of winning the lottery on each outcome, estimated with and without controls, and bars report their respective 95% confidence intervals (robust standard errors clustered at the respondent level). All outcome variables are binary. See Tables I1–I4 for the full set of results.

The data also support H2. We find that lottery winners support the lottery system much more enthusiastically than non-winners, as shown in Figure 1. In the recent lotteries survey, winners' belief in lotteries' justness is 0.22 ($p < 0.001$, with controls) higher than non-winners', which is equivalent to a substantial standardized effect of 0.44. Due to randomization and the timing of the survey (before moving into their new homes), it is reasonable to assume that the only difference between winners and non-winners at the time of the survey was that the former had won the MCMV lottery. This difference in support for the lotteries remains unaltered for individuals who participated in MCMV lotteries several years earlier, many of whom reside in the MCMV units. Winners in the early lotteries are still much more likely to approve of lotteries compared to non-winners (0.05, $p < 0.01$), with controls), a standardized effect of 0.11.

The similarities in findings in both surveys are striking, given the differences in time elapsed since the lottery for each survey. They are even more

striking when we consider that for the other outcomes, we find essentially no differences between lottery winners and non-winners except that winners in the recent lotteries are ever so slightly more likely to say that MCMV improved people's lives.

In short, lukewarm for the lottery is an outlying aspect of MCMV. Relative to a program that is well evaluated overall, the lottery is unpopular and polarizing (H1). Moreover, the small minority of winners are much more likely to evaluate the lottery positively than non-winners, possibly due to self-serving bias rather than beliefs in lotteries' justness (H2).

What is the Problem with Housing Lotteries?

Lotteries are not regarded as particularly just among winners and non-winners, but winners are more likely to see lotteries as just than non-winners. In contrast, the MCMV program is very well evaluated overall, and homeownership – the good it provides – is highly coveted by all applicants. Based on these findings, applicants' attitudes about lotteries' justness should be connected to applicants' own judgements about what is just, the lotteries' implementation, and their own outcomes (whether they were selected or not), rather than simply reflecting negative views about other aspects of MCMV.

To gain further insight into the meaning of our quantitative results, we conducted 15 in-depth interviews, lasting from 30 minutes to up to 2 hours, with MCMV applicants, 10 winners and 5 non-winners, who had participated in recent MCMV lotteries. The interviews were conducted in person in mid-2018 and, at that time, none of the winners had yet moved into the housing projects. These interviews followed a semi-structured script in which subjects were asked open-ended questions about different aspects of their experience with their housing program. All interviews were recorded, transcribed, and then read and analyzed by two of the authors. In Appendix L we provide additional details about the interviews and the analysis.

Most subjects knew about the lotteries and their attitude towards the lotteries did not likely come from an intrinsic misperception or misunderstanding of how the selection process worked. In fact, only one interviewee mistakenly thought they were on a waitlist. Furthermore, only two voiced (hearsay) concerns about the lottery being rigged. Overall, respondents understood the key defining principle that lotteries meant an equal chance of being selected and they perceive MCMV lotteries as well executed.

When asked open-ended questions about the lotteries' justness, subjects' opinions varied considerably. Consistent with our quantitative findings, about half of our interviewed subjects expressed either hesitancy or clear disapproval of using lotteries as a selection method for beneficiaries of housing. Much of the criticism of lotteries revolved around notions of "deservingness." In subjects' views, superior processes for selecting beneficiaries would imply

at least the combination of lotteries with other methods based on need or wait time. For example, interviewee M1 mentioned that lotteries did not consider individuals' needs (**I** denotes the interviewer):

> **M1:** I disagree [that selecting beneficiaries via lottery is just]. I think they need to see how that person actually lives. **I:** If it wasn't a lottery, what criteria would be more just, in your opinion? **M1:** To check each person individually, see how they live, their neighborhood, if it's an at-risk area, if they really own no other property, their living standards. That's how I think it should be. […]

Similarly, M3 is not entirely opposed to lotteries, but she finds it unjust that "**M3:** people who don't need it are there [MCMV]." When asked about the alternative to lotteries, she says "**M3:** I think [choosing] based on financial matters. […] There is a database there, it wouldn't be so hard to find people's income. There are people with very low income who need it."

Other interviewees were critical of lotteries for *not* imposing minimum requirements in order to guarantee that beneficiaries will be "adequate" homeowners. For example, M4 explains the need for additional vetting for beneficiaries:

> **M4:** Can you pay your electricity bill? Can you pay the condominium fees? Can you …? 'Yes' Then you can live here. If you do not, you cannot. Because some people who want to live here can afford these things and they want to live well. So, I believe they had to ask question and be more like …'Oh, I don't have resources', 'Then leave, son. Next month you will leave. It's over' [If not] Good people will leave. They don't like seeing [bad conditions], they won't stay. Why? Because they know they could put their family at risk. And then they leave. Then the place becomes a place for bad things. Do you understand?

Both of these arguments resonate with theoretical criticisms of lotteries being inefficient (Boyce, 1994). By themselves lotteries do not select the "correct" set of beneficiaries, be those the ones who need it the most or those who have the means and the required social skills to live in housing projects, according to many of our subjects.

Even among those who approve of the lotteries, subjects raise the issue of "homogeneity" of beneficiaries as an important assumption for the justness of lotteries. For example, interviewee M11, who supports the lotteries, conditions her support on the fact that those entering the lottery are all equally in need of a home:

M11: […] [O]nce I fit perfectly [the requirements] for this type of lottery and thousands of people too, in principle, we are all on equal conditions. If we are on equal conditions, the lottery is okay. **I:** But what do you think of the lottery [the interviewer asks to clarify]? **M11:** Provided we all fulfill the requirements, then we are all on equal conditions, it is okay.

Part of the frustration, shared by others, was the assumption that they would eventually be selected, which is wrong, and that their chances of being selected were higher than in fact they were. These types of criticisms suggest that more subtle aspects of lotteries (such as the odds of winning) and the uncertainty of anyone ever being selected, can be difficult to convey to the general public.

Transparency was a common argument in favor of the lotteries. Subjects often refer to the lotteries being a more honest and transparent process than other methods and, as M13 stated, avoiding the "hand picking" of beneficiaries by those in charge:

M13: In my opinion, I don't think there is any other way. How are they going to do it? People will go, they'll grab one ticket just like however many thousands of others and then everybody is like 'Okay, I'll take this apartment, that apartment…?' No way, it doesn't work like that. With a lottery, everyone has their ticket and whoever wins, wins. Then people understand that there was a drawing, no one was "hand picked." That way there's no problem. **I:** And this certainty that the lottery took place is based on what? **M13:** Because as people win we see that they actually enrolled, waited, and then were selected. We know that lotteries are taking place.

Arguments such as this suggest that lotteries might be particularly useful in environments where discretion by officials is linked to favoritism. It is also consistent with the subjects' evaluation of how the lottery worked in practice. With only a few rare exceptions, interviewed subjects did not question the lotteries' probity. We directly asked them whether the lottery was rigged or whether there was favoritism in the implementation of the housing programs.[8] The overwhelming majority of the respondents found the lottery to be well-run, and did not allude to favoritism or fraud. For most subjects, the appeal of the lotteries was due to their probity and lack of bias in distributing benefits and not to giving everyone an equal chance.[9]

We do not see stark differences between winners and non-winners in their evaluations of lotteries as an appropriate selection method. Although our set of

qualitative interviews is small, we also see that winners are strong supporters of need as an additional criterion for selecting beneficiaries.

Interviewees' insistence on the importance of need over luck can help explain the relatively low support for the lottery across the board, but does not explain the marked difference in assessments between winners and non-winners in the quantitative analysis. In fact, the concern about selecting "bad neighbors" should, if anything, lead to lower support of the lottery among winners. Seen in this light, our quantitative results suggest that respondents are employing a consequentialist argument when evaluating the lottery, even if they are not overtly voicing it. The primacy of need also suggests that, at least from the point of view of many applicants, considerable variation still exists within the group of individuals that are eligible for the program. Although need is the major eligibility criteria, interviewees still think some of the eligible are not "appropriate" beneficiaries.

Overall, the qualitative evidence suggests that MCMV applicants appeared to echo a common criticism. The lottery principle requires commensurability, but particularly for those potentially affected by the outcomes of lotteries, no two individuals can ever be equally deserving, equally "fit," or have equal need (Hofstee, 1990). As a consequence, many applicants turned to other selections methods that reduce this incommensurability problem, such as queues and need-based, even if need is already an important criteria to be eligible for the lottery.

Lotteries, Queues, and Need

We designed, pre-registered (see Appendix P), and fielded a survey experiment as a follow-up study to evaluate the insights from our qualitative analysis and to assess H3–H6. In order to examine whether aversion to lotteries generalizes to a broader public and to circumvent the self-serving attitudes we found in our first study, we recruited a national sample of 2000 individuals. That is, while our first study included only applicants to the MCMV, in this study potential applicants are a very small share of the sample. Interviews were conducted face-to-face in households selected via a three-stage sampling scheme between July 27 and 31, 2022 (Appendix M).[10]

All individuals were initially presented with a common vignette describing a hypothetical housing program that was oversubscribed despite having an initial income-based eligibility criterion. Each participant was subsequently randomly assigned to receive one of three experimental vignettes, using simple randomization with equal probability. One vignette specified that beneficiaries would be chosen from the elible pool based on additional need criteria (income, health and living conditions, and age), which implied that additional data would be collected by the government. Another vignette specified that beneficiaries would be chosen from the eligibility pool using a

first-come-first-served rule (queuing). The last vignette specified that beneficiaries in the eligibility pool would be chosen via the well-known federal public lottery, as follows:

Introductory vignette (common to all treatment arms): Consider a housing program in which the government gives new houses to low income families who, in exchange, pay in affordable installments over many years. Only families that receive less than one minimum wage can sign up to receive a home. But, still, there are a lot more people who sign up than houses available. To chose among those who signed up and had income lower than one minimum wage, the government decided to…

Need-only treatment: prioritize families with lower income, living in places at risk or whose family members have serious health issues or are elderly.

Queue treatment: prioritize families that have been waiting the longest.

Lottery treatment: do a public lottery to choose the winners.

We then asked each respondent four outcome questions. The first two were almost identical to questions we asked in the original survey analyzed in Section 4: whether such a program contributed to improving people's lives and whether the method of selection was just. We also asked whether the method of selection of beneficiaries presented to subjects would result in the selection of those most in need, and whether individuals who were politically connected would have greater chances of being selected. We report the full text of all vignettes and questions in Appendix M.

These outcomes allow us to evaluate the hypotheses we stated in Section 3. Specifically, we expected that lotteries would not impact the overall evaluation of the program (H3), would be considered less just than the other methods (H4), would be seen as less likely to select those most in need (H5), and would be seen as less prone to favoritism (H6).[11]

Experimental Results

Table 2 reports the results without controls as we found no meaningful imbalances on pre-treatment covariates (Appendix N). The questions were answered on four- or five-point scales, but following our PAP, all outcome variables were dichotomized for analysis with the substantively positive responses recoded as 1 and "don't knows" as missing. Hence, treatment effects can be interpreted as differences in proportions (we report results with variables in their original scales in Appendix O). The experiment did not have a pure control group, so we arbitrarily set the "need-only" condition as the baseline category.

As in our study of MCMV, evaluation of the (hypothetical) housing program as one "that improves people's lives" is very high, with 90% of respondents agreeing with the statement. This value was slightly lower for

Table 2. Experimental results (all Outcomes).

	Prog. Eval.	Justness	Efficiency	Favoritism
	H3	H4	H5	H6
Need-only (baseline)	0.903*** (0.012)	0.805*** (0.015)	0.697*** (0.018)	0.180*** (0.015)
Queue	−0.038* (0.018)	−0.090*** (0.024)	−0.040 (0.026)	−0.013 (0.021)
Lottery	−0.192*** (0.021)	−0.259*** (0.025)	−0.104*** (0.026)	0.024 (0.022)
Num.Obs	1936	1924	1917	1908

Notes: ***$p < .001$; **$p < .01$; *$p < .05$; $^{\cdot}p < .1$. Robust standard errors. No pre-treatment covariates included.

those in the selection by queues treatment and (unexpectedly) substantially lower (-0.19, $p < 0.001$) in the lottery condition.

For our main outcome of interest the results are even worse for the lottery. Lotteries were perceived as substantially less just (-0.26, $p < 0.001$) than the need-based selection and to the need-based and queue methods combined (-0.22, $p < 0.001$). The lottery is also seen less likely than either of the other methods to select the most worthy beneficiaries (-0.1, $p < 0.001$) and its main upside effect, a possible check on favoritism, was very small and not statistically significant (0.02, $p = .27$). We also found evidence that lotteries are seen more negatively than the need and queue across relevant subgroups of respondents, as shown by our largely null heterogeneous effects in Appendix O.

Interestingly, evaluation of the program and approval of the lottery are comparable across our experimental and MCMV study samples. This descriptive finding suggests that lukewarm support for lotteries is a consistent result, and holds across different demographics and different samples. The results further cement the indictment of lotteries that emerged from the qualitative investigation: many individuals find lotteries not to be a just way to select beneficiaries, and lotteries even lose out on a head-to-head comparison with queuing, which has weak basis on normative grounds to being just. Our quasi-experimental results suggest that winners might eventually seek to justify their use, but non-winners and the general public are not enthusiastic supporters of lotteries in general and the general public prefers other methods compared to lotteries. Also consistent with our qualitative findings, need emerges as the most appropriate criteria, even after a basic income eligibility criteria are met. We interpret this result to mean that individuals are not likely to perceive applicants to be equally "deserving" or have "equal claims to a good," which undermines lotteries' claim to being just. Furthermore, our experimental results suggest that lotteries can detract from that support, even when baseline support is high.

We acknowledge that results might have been different had we provided individuals with more information on the efficiency, potential for fraud, and bureaucratic costs implied by different selection methods. While exploring how individuals handle trade-offs between these features is potentially interesting, our design is closer to the level of information that citizen typically consider when thinking about these issues. As our qualitative interviews suggest, interviewees understand the fundamental aspects of lotteries, but they do not appear to give consideration to these trade-offs even when asked to reflect in depth upon lotteries during our qualitative interviews.

What to Do About Lotteries?

The use of lotteries to select beneficiaries of government programs is normatively acceptable when distinguishing between claimants is impossible or cost-ineffective. However, at least for allocating public housing units, neither the general public nor those directly affected by the lotteries seem to agree: we find relatively low levels of support for the use of lotteries, a large gap in support between winners and non-winners, substantial awareness of lotteries downsides (such as inefficient allocation) a little appreciation for its potential upsides (such as eliminating favoritism). Institutional features of our empirical setting suggest that these results are not seem to be driven by fears that the lotteries might be rigged and results hold despite the fact that the lotteries we evaluated are only used to choose among a pool of applicants that was preselected to meet certain need conditions.

These results are a substantial addition to our hitherto very limited stock of evidence about the public's evaluation of real world public policy lotteries. As with any initial study, we leave several stones unturned, particularly with respect to scope conditions. Would lotteries be more acceptable to distribute social burdens than government benefits (as was the case with MCMV)? Would potential beneficiaries warm to the use of luck if the costs of more precised targeting were emphasized by policy makers? Have we documented the public's objection to the use of lotteries in the context of a specific government program, or uncovered an instance of a more general phenomenon of lottery aversion for most types of government programs? Furthermore, if individuals were informed of the trade-offs involved in lotteries and explicitly asked to assess the pros and cons relatively to other selection methods, would support for lotteries be lukewarm? While we leave these questions for future research, the importance of the results that we present is clear.

The public's reticence towards lotteries should be considered in normative and technocratic discussions about policy. If lotteries fail to fulfill their normative promise in the eyes of the public, lottery proponents should take heed. If approval is disproportionately restricted to winners, lotteries could harm a program's support and policy entrepreneurs' ability to build coalitions around it.

While politicians may not take public opinion into account when deciding the finer aspects of government policies, disputes about who gets what and how are deeply political and can be used to mobilize groups in favor or against a policy even during the implementation stage. Our findings raise considerations, albeit indirectly, that help explain the allure of more burdensome or more discretionary methods of selection of beneficiaries, such as complex procedures to evaluate need; public misgivings about randomization can,

therefore, be used as a justification for less transparent or efficient choices in policy design.

Differences in support for lotteries among winners and non-winners indicate that individuals' own circumstances significantly affect how they regard the lotteries. No normative argument in support of lotteries is compatible with marked differences in opinion between winners and non-winners, so these differences reveal that the public uses a different logical altogether through which to evaluate lotteries. In practical terms, given the small number of winners relative to participants in settings like that of the MCMV, the contribution from the winners' support is small. While the program is well evaluated overall, our descriptive and experimental results suggest that this popularity is not helped by the selection procedure. Our result, on this point, echoes those by Kuipers (2023), who found that even "fair" selection procedures can generate dissatisfaction among those who are not selected and, ultimately, undermine support for government actions and even social cohesion.

But our results also provide some guidance for the conditions under which selecting beneficiaries by a lottery system could, in fact, be regarded as positive by a majority. Lotteries, and housing lotteries in particular, might be more acceptable once the public perceives all participants are similarly entitled, deserving, and adequate to receive the good that is being allocated. In short, whenever claims are truly equivalent, as specified by the lottery principle (Stone, 2011), lotteries may stand a chance. However, while better communication seems achievable in cases of programs such as the MCMV, this requirement may spell trouble for randomized controlled trials that require larger samples or more heterogeneous subjects.

In addition to better communication, the eligible pool of lottery participants could actually be made more homogeneous. The challenge, here, is that doing so may require more information, which in turn can make it harder for potential beneficiaries to prove eligibility and to overburden bureaucrats. The MCMV program only employs a lottery to choose from applicants that met a need requirement. Likewise, we also made clear in our survey experiment that the hypothetical housing program was oversubscribed *after* applicants were screened for need. In both instances an effort was made to signal some level of equivalence in the lottery's pool. Based on the normative theory, both instances were likely cases for finding support for the lottery. And yet, no such support was found. The main lesson here is that, at least in the eyes of the public, it might be very difficult to achieve equivalence of claims.

Hence, perhaps lotteries are better suited for situations in which the equivalence of claims does not depend on data collection. These would include situations in which, out of principle, the whole pool of applicants is equally worthy. Universal programs for which there is excess demand, such as access to vaccines, school slots, or passes to visit restricted public land, are

stronger candidates than most social policies that are typically associated with some form of means testing.

Scarcity is a feature of many government programs across the globe and across policy domains. Randomization as a method for allocating benefits enjoys some popularity with policy makers and scholars because of the advantages of random assignment when learning about a program's impact. While citizens' views about selection methods for allocating benefits are an ethically and instrumentally important part of creating policy buy-in, we knew little about those subjected to randomization feel about it as a method of determining receipt of benefits. Our paper shows this might be a problematic blind spot. Understanding the underpinning of citizens' attitudes and developing recommendations to improve legitimacy should be a vital part of policy and impact evaluation research.

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Data Availability Statement

Replication materials and supplemental information are available in (Bueno et al., 2024). The data and materials required to verify the compuational reproductibility of the results, procedures, and analyses in this article have been reviewed by Yale University's Institution for Social and Policy Studies.

Supplemental Material

Supplemental material for this article is available online.

Notes

1. The MCMV lotteries are used for allocation purposes only; they are not part of any RCT.
2. Executive orders 140/2010, 610/2011, 595/2013, and 412/2015.
3. Age affected the overall selection process only very marginally, as in most cases additional lotteries were necessary to distribute all available units. Our main findings hold regardless of whether age was utilized.
4. For the recent lotteries survey we find statistically significant differences for years in formal employment and log wages in formal employment, but these detectable imbalances are not consistent across specifications and within lotteries.
5. Importantly, we recruited survey respondents independently of the mayors office and our enumerators were instructed to explicitly state that that our survey was not part of the program. We also employed different databases to find individuals' contact information than those used by the city government.
6. Lottery winners and non-winners are almost equally represented in our sample, even though only a tiny fraction of those enrolled in each lottery were winners. This design, which oversampled from lottery winners, was chosen in order to facilitate comparisons between the two groups, as detailed in our PAP.
7. In the recent lotteries survey we control for age even in the estimation "without controls" because winners were sorted by age in decreasing order in case there were more lottery winners than units available.
8. For subjects who were winners, we emphasized that "others" could be involved in a "rigged lottery" to avoid social desirability bias.
9. This point finds echo in 50 qualitative interviews we conducted with participants in a different housing-related lottery administered by an NGO. See Appendix L.
10. The pre-registration can be found here: https://osf.io/cah3w. See Appendix P for details.
11. We also pre-registered two expectations for heterogeneous effects as research questions (Appendix O).

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