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The rationality of qualified lotteries

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A lottery (or random selection) is often considered to be irrational. However, a qualified lottery can lead to a second-order rationality on an institutional level. The main idea is to make use of uncertainty, either by exploiting existing fundamental uncertainty or by deliberately enlarging uncertainty through lotteries. In both cases, decision quality may be enhanced by increasing diversity and risk diversification, by decreasing biases and noise, and through a strong disempowering effect by the shadow of uncertainty. The paper shows the different ways in which qualified lotteries have been used in history, analyses why this procedure has been forgotten despite its clear advantages, and compares it with competitive selection mechanisms.

KEYWORDS
focal random selection, governance, institution, qualified lottery, radical uncertainty

INTRODUCTION

Today, a lottery or a random selection is accepted by most people only in a few situations, for example, for statistically representative surveys, for statistical quality control, for ticket control in public transport, or for security checks at airports. In contrast, the selection of candidates by lot is mostly considered to be irrational and a contradiction to human reasoning. Yet, in the European past, random selection has played an important role for different purposes. In particular, the selection of leaders by qualified lotteries has a rich history but has fallen largely into oblivion.

We argue that the resurgence of qualified lotteries has the potential to enrich our concepts of rational decision making. Even when those models have been extended in a type of heuristics (Grandori, 2010) and intended to cope with fundamental uncertainty or "unknown unknows" (Taleb, 2007; Faulkner, Feduzi, & Runde, 2017), they remain centered on the logic of single decision makers. In contrast, a qualified lottery is a procedure at an institutional level[1] concerning multiactor decision making. Under certain conditions, it provides a second-order rationality beyond individual rationality. Qualified lotteries counter the undue influence of powerful people, weaken the incentives to engage in bribery and other manipulative behavior, raise the quality of decision makers, help to avoid the meritocracy bias, and increase diversity, therewith increasing resilience in the face of fundamental uncertainty. To our knowledge, we are the first to substantiate qualified lotteries with this new rationale.

Our article starts by clarifying what qualified lotteries are. Second, we provide an overview of how this method has been applied in the past. We third analyze why this procedure has been largely forgotten despite its clear advantages. Fourth, we argue that meritocracies, which are the outcome of conventional competitive selection procedures often fail. Fifth, we demonstrate why qualified lotteries contribute to a second-order rationality by avoiding meritocracy bias, improving the quality of decision makers, and dealing with fundamental uncertainty. Sixth, we compare qualified lotteries with competitive selection procedures and their possible improvements more closely. We end by discussing the limitations of our approach.

WHAT IS A QUALIFIED LOTTERY?

Random selection or aleatory procedures (derived from Latin alea, the die) contribute to a second-order rationality under certain conditions (Elster, 1989; Stone, 2010; Buchstein, 2020). The most prominent argument for decision making by lot today is indeterminacy.[2] Indeterminacy occurs when individuals are unable or unwilling to find a well-founded decision. In these situations, random procedures may be considered rational at an institutional level though at the individual level lotteries ignore reasoning and will. Instead one has to recognize the limits of

individual rationality and accept at the institutional level that chance is allowed to decide. In this vein, lotteries may provide a second-order rationality.

Jon Elster (1989: 107–121) classified three types of indeterminacy: First, absolute uncertainty; second, uncertainty facing two or more options that are equally good, or uncertainty within the limits of whether it pays to find out the better option. Third, the incommensurability of preferences when decision makers are unable[3] or unwilling[4] to rank two or more options. In these cases, there are no good reasons for ranking the different options.

In case of incommensurability, there are some potentially bad reasons creeping into the decision process at the institutional level, such as corruption, cronyism, and discrimination. They undermine fairness as well as the stability of the community (Stone, 2009, 2010). A lottery insulates from such bad reasons. To make use of this insulation, it may be rational to deliberately generate indeterminacy by lotteries (Duxbury, 2002). Examples are randomly selected juries in the judicial system, citizen's forums in representative democracies (Fishkin, 1988), random assignments of members of Congress to congressional committees (as suggested by Thaler, 1985), or distribution of scarce and indivisible goods or rights such as study places or hunting licenses (Heinzmann, 2020). In all these cases indeterminacy reduces the role of human agency. Thereby it has a disempowering effect, generates a strong disincentive to engage in manipulative behavior, and diminishes the possibility of any minority being permanently unrepresented.

However, lotteries also have some major disadvantages: They ignore individual performance, merit, and will; and they undermine traditional sociopolitical structures (Goodwin, 2013). Therefore, a mix of lotteries with traditional selection mechanisms helps to reduce the disadvantages while diminishing the "bad reasons." To do so, two main forms of qualified lotteries have been applied. The first starts with a preselection of individuals according to generally accepted criteria, mostly qualification and experience. The outcome is a shortlist out of which the winner is drawn by lot. The second form does not determine a person but a committee, which is drawn by lot. This committee acts as an electoral body that chooses the winner in a competitive election. Both forms of qualified lotteries have been practiced in the past, as well as a mix of both procedures.[5]

The combination of lotteries with a preselection according to conventional criteria is called "qualified" because these conventional criteria make use of some generalized perceptions or assumptions about desirable, proper, or appropriate actions or judgments providing legitimacy (Suchman, 1995: 574). Qualified lotteries meet performance criteria as well as the expectation that performance evaluations motivate individuals to make an effort in the "right" direction. Moreover, they also meet the unease perceived by many individuals when applying a selection procedure that disregards any reasoning, merit, or human will, may the reasons be right or wrong.

A LOOK INTO THE HISTORY OF QUALIFIED LOTTERIES

Up to the French Revolution, the random selection of political positions was widespread for different reasons. Yet, a common ground was to deliberately generate uncertainty in order to disempower the ruling elites.[6] In classical Athens, democratic aspects were in the foreground but also the prevention of corruption. Intellectual greats like Aristotle regarded only a random system to be genuinely democratic. In Athens in the fifth and fourth centuries BC the members of the *boulê*,[7] judges, and magistrates were appointed by lot among the citizens, excluding women and slaves. In the beginning, lotteries were associated with the will of God. However, Aristotle no longer regarded the lottery as a medium for determining a divine will. Instead, he associated it with rationality and political virtues (Buchstein, 2020), though there was no understanding of randomness in a mathematical sense.[8] In the 18th century, Montesquieu (1748/2003), the founder of the modern constitutional state, also described the selection by lot as genuinely democratic. In contrast, he considered election by vote to be aristocratic.

In the Middle Ages and the early modern period, another reason had become important. The goal was to avoid costly disputes between influential families as well as to save money spent on bribery. By deliberately introducing indeterminacy bribery became less attractive, and the chances of unscrupulous politicians backed by powerful cliques to come into office were reduced (Duxbury, 2002:31). The most prominent example was the electoral system of the Republic of Venice. The Doge—the chief magistrate—was determined in a multistage process. The procedure started with a lottery that included all members of the Grand Council to determine the electoral body, followed by a competitive election. In 10 rounds in which competitive selection and random selection alternated the Doge was finally chosen by competitive election (Buchstein, 2009). A similar procedure was applied in Parma, Brescia, and Bologna. In Florence, qualified random selection to appoint the magistrate is introduced in a different way than in Venice. The candidates were first elected by the noble families and guilds. Then, a lottery took place to determine the "Signoria" (McCormick, 2006; Pocock, 2016; Sintomer, 2014, chapter 3.8). This procedure was also applied in Siena, Lucca, Orvieto, and Perugia (Van Reybrouck, 2016). On the whole, there was an "inflation of decisions by lot" in the Italian republics of Northern Italy (Keller, 1990). It produced extraordinary prosperity and stability for these communities for more than 500 years. It prevented the powerful families to engage in detrimental political conflicts. Qualified lottery procedures were also used in

Spain and Germany, for example, in Münster and Frankfurt, and even in China (Sintomer, 2011). These procedures also have a rich tradition in Switzerland, where in 1625 the Secret Chamber of Fribourg, a small Swiss town, presented an early version of a lottery procedure to determine the government. Numerous municipalities and cantons subsequently adopted this model for the selection of political leaders as well as for the selection of members of councils (Weber, 2018). In all these cases the goal was not to strengthen democratic participation. Large parts of the population not belonging to the powerful groups were excluded.[9] Nevertheless, the system ensured relatively broad citizen participation.----------

At the University of Basel, the qualified lottery procedure was introduced for yet another reason, namely, to increase the quality of the professors (Burckhardt, 1916; Stolz, 1986; Rost & Döhne, 2020). The University of Basel, the oldest university in Switzerland founded in 1460, is considered to be one of the birthplaces of European humanism. However, its reputation declined in the 17th century, due to cronyism and nepotism. To fight these deficits, the city of Basel adopted a qualified random selection, which at that time was common in many Swiss communities. A two-stage lottery, the "Wahl zu Dreyen" (selection among three) was practiced from 1718 to 1818 to select professors. Three appointment committees selected from all professors were chosen by lot. Each of these committees had to nominate a candidate according to traditional criteria. The three candidates then made it into the so-called Ternarium (lat. containing or consisting of three things). If all three committees favored the same candidate, this candidate was chosen. If two of the three committees favored a particular person and the third one another person, then the one with two votes was selected with a probability of 66.6%. If all three committees preferred a different candidate, each one had a chance of 33.3% being selected. In a letter to the city's council the head of the academic senate of the University of Basel wrote in 1737: "Every day we hear people say: I have made it into the Ternarium, what more could I ask for? No envy, no jealousy against the beneficiaries. Luck had made the decision" (own translation: Burckhardt, 1916: 35).

The lottery procedure for the election of candidates at this time was so popular that it even became a model for the state lotteries emerging throughout Europe, not the other way around (Haug, 2017).

WHY HAVE QUALITATIVE LOTTERIES FALLEN INTO OBLIVION?

If qualified lotteries were so popular, had so many advantages, and were applied by so many communities in the prime of their time, why have they rarely been used after the beginning of the 19th century?

The Enlightenment plays an important role. It is based on the idea that human will and the pursuit of knowledge obtained by means of rationality should replace arbitrary and passive decisions. Immanuel Kant (1784) "Sapere aude! Have the courage to use your own reason!—that is the motto of enlightenment"[10] prima facie contradicts a procedure that prevents decisions being made based on will and reason. Randomness was considered irrational and illegitimate. For example, the French writer and politician Francois Guizot (1821) wrote: "The legitimacy of power is founded solely in the harmony of laws with eternal reason." Only a few authors of the Enlightenment—for example, Montesquieu (1748/2003) Rousseau (1762), Condorcet (1769), and Bentham (1791)—considered the second-order rationality of lottery processes (Buchstein, 2020).

The French Revolution also favored the disappearance of qualified lotteries. On the one hand, the famous pamphlet of Sieyès (1789), which became the political manifesto of the Revolution, stated: "What is the Third Estate? Everything. What has it been hitherto in the political order? Nothing. What does it desire to be? Something." On the other hand, it was never thought of giving power to the "Third Estate." Instead, an intellectual elite should be responsible for the welfare of the community (Frey & Zimmer, 2023). Siéyès and other revolutionary thinkers were afraid of the unrest that would break out if the lower classes were given more power. As a consequence, the hereditary aristocracy was replaced by an elected aristocracy which rejected aleatoric procedures as well as democracy (Manin, 1997; Van Reybrouck, 2016). Nor were the social democratic and communist parties keen on lotteries because they saw themselves as the embodiment of an alternative elite (Buchstein, 2009: 224). Karl Marx (1843/1972: 235 ff.) was a determined opponent of lottery processes. Socialism was to bring about the rule of reason and a rationally planned economy.

In summary, "the quiet end" of qualified lottery processes after the French revolution (Buchstein, 2009, chapter 4) may be explained by a mix of Enlightenment's excessive belief in rationality and the fear of the political and economic elites to losing power. The danger of losing control of those who are on top of the hierarchies might be the most important reason why qualified lotteries were no longer advocated and are still today rejected by large parts of the elite.[11] Also, many contemporary social scientists disregard this decision procedure. For example, the former existence of such lotteries in some countries has been rediscovered only recently, for example, in China (Will, 2002) and in Switzerland (Chollet, 2019).[12] Famous social scientists like Kahneman (2011) criticized the inner drive of most individuals to seek an explanation for every event. Taleb (2005) labeled the tendency to see causalities where there are none as "fooled by randomness." Nevertheless, both scientists did not consider the

possibility of using randomness deliberately to achieve more effective decisions at the institutional level.

Today a revival of aleatoric procedures is on the way. They are considered an answer to the crisis of representative democracy (Manin, 1997). Frey (1969) was one of the first to discuss aleatoric procedures in this vein. Later, Fishkin (1988) initiated the so-called "deliberative democracy" in which randomly drawn citizen's forums discuss political issues. Buchstein (2009) proposed a second chamber of parliament in the European Union—a "House of Lots"—to achieve a broader representation of citizens.[13] Van Reybrouck (2016) even went so far as to claim that elections should be completely abolished. However, these authors did not consider *qualified lotteries* as an institutional measure to increase the quality of decision making, to prevent a meritocracy bias, and to provide resilience when faced with fundamental uncertainty.

WHY SELECTIONS BASED ON MERITOCRACY OFTEN FAIL

The term "meritocracy" was coined by Michael Young (1958) as a warning against an obsession with quantification, test scoring, and performance appraisals in the achievement society. Meritocracy has led to a counterproductive belief in a rational process of performance evaluation and the selection of elites. It can be interpreted as an undesired heritage of the enlightenment (Frey & Zimmer, 2023). According to this belief, success is mainly, if not exclusively, due to personal qualities such as talent, intelligence, hard work, and willingness to take risks (Pluchino, Biondo, & Rapisarda, 2018). This is substantiated by the rapid increase in social inequality in highly developed industrial countries (Piketty, 2015; UBS & PWC, 2020), which does not fit into the picture of a true achievement society. The resulting tensions are fueling populist resentment and a "meritocracy trap" (Littler, 2017; Markovits, 2019; Sandel, 2020). The failure of meritocratic principles is reinforced by the rise of winner-take-all markets that are characterized by the power law: A small number of hyperperformers satisfy the entire demand in the market, whereas the majority more or less goes empty (Cook & Frank, 2010).

This development contradicts what we know from the distribution of talent in the population. It to a great extent underexploits highly talented individuals. Talent (intelligence, skills, abilities, and willingness to work hard) follows a Gaussian distribution; 68% of the population are talented around the standard deviation of the average value; 95%, around twice the standard deviation of the average value; and almost 100%, around three times the standard deviation of the average value (Pluchino, Biondo, & Rapisarda, 2018). If marginal productivity in winner-take-all markets were to determine compensation, the distribution of talent in the population would justify much lower wage differences between low and high performers, that is, a maximum multiplier of about six—far less than the observed wage differences.[14] In winner-take-all markets, first and foremost luck—and to a much lesser extent talent—plays an extraordinary role in producing brilliant results (Liu & De Rond, 2016; Osterloh & Rost, 2019). However, this is not taken into account with the prevailing selection procedures characterized by a strong belief in rational performance measurement.

There are impressive examples of such meritocracy traps. For example, Gladwell (2008) showed that at least 40% of Canada's hockey elite were born between January and March of any given year. The background for this astonishing finding is the recruiting deadline for an age cohort dated December 31. Those who were lucky to be born in the first 3 months of a year were older and physically more mature than players born later in the same year. The lucky ones enjoyed more playing experience and better trainers. Similarly, Einav and Yariv (2006) showed that it is easier for economists in the United States to obtain a permanent job at a university if their family name is at the beginning of the alphabet. This correlation is particularly evident for the most highly ranked faculties in the country. Van Praag and Van Praag (2007) found that professors of economics with the initial letters A–C have an above-average number of publications in the most prestigious journals, in contrast to professors with the initial letters X–Z. In the case of art evaluations, Ginsburgh & Weyers (2014) showed that with the Oscars, the Booker Prize, and the Queen Elizabeth piano contest, among the finalists, the winner is determined mainly by luck.

Studies in strategic management demonstrate that the profitability of companies is largely not explained by the main factors that are the focus of strategy textbooks (Liu & De Rond, 2016). Organizational performance is affected not only by the leader's quality but also by many factors at the industry and organizational level (Harrison & March, 1984; Weber et al., 2001) as well as by sheer luck (Bertrand & Mullainathan, 2001; Frank, 2016; Liu & De Rond, 2016). McGahan & Porter (2002) found that half of the variance in the performance of a firm is unexplained. Firm growth rates are almost random (Geroski, 2005; Coad, 2009). Berry and Fowler (2021) found little evidence that chief executive officers influence the performance of their firms.[15] Thus, the assessment of a top manager's performance often comes close to an unintended lottery (Liu, 2021).

The Matthew effect ("the rich get richer and the poor get poorer", Merton, 1968) widens the gap between the lucky ones who made it and those who narrowly failed. Bol, de Vaan, and van de Rijt (2018) compared junior scientists in the Netherlands who just met the bar to qualify for post-PhD research with those who just missed the bar. The successful group went on to get more than twice as much research funding in the subsequent 8 years and

were 50% more likely to get a professorship. Similarly, Chan et al. (2014) with respect to prestigious academic awards found no statistically significant performance differences in the post-award period. The awardees do not differ from a synthetic control group of non-awardees at the time when they got the award. Nevertheless, the awardees increase their publication output by 15% more compared to the control group 5 years after the award.

The Mathew effect is enlarged by homophily, that is, committees often favor the candidate who is most similar to their members, as well as by sheer discrimination of minorities. Hartmann (2000, 2007) estimated that 80% of CEOs from large public companies are offsprings of upper-class families that make up 1% of the population. Even when upward-mobile children are successful in entering elite positions, they often are unable to accumulate equivalent social capital and class-specific habitus compared to upper-class children (Bourdieu & de Saint Martin, 1978; Hartmann, 2000, 2007; Friedman, Laurison, & Miles, 2015; Laurison & Friedman, 2016). Even 10 years after graduation, substantial income differences persist between graduates with similar academic credentials but different socioeconomic backgrounds (Witteveen & Attewell, 2017). Overall, access to top positions, especially in traditional professions with rigid hierarchical structures, is characterized by homophily. This leads to a class reproduction among the elites though it appears to be a competitive performance selection (Torche, 2011; Mitnik, Cumberworth, & Grusky, 2016; Oh & Kim, 2020).

These observations destroy the myth of meritocracy, namely, that extraordinary talent, intelligence, hard work, and willingness to take risks explain success to a high degree (Frank, 2016).

WHY QUALIFIED LOTTERIES MAY RAISE DECISION QUALITY

The previous findings show that conventional selection procedures cannot deliver on their promise of finding the best performers, though they can be improved by several measures (see below). Moreover, in times of fundamental uncertainty, they are unable to identify the best decision makers in the future. To redress these inherent limitations of competitive selection processes, we consider five reasons why qualified random selections increase the quality of decision making: (1) avoidance of the meritocracy bias, (2) enlargement of pools of high-profile candidates, (3) creating a diversity bonus, (4) reducing hubris, and (5) accepting the convexity of performance. The main idea is to make use of uncertainty, either by exploiting existing fundamental uncertainty or by deliberately enlarging uncertainty through lotteries. In both cases, decision making quality may be enhanced by increasing diversity and risk diversification, reduction of biases and noise, and a strong disempowering effect by the shadow of uncertainty.

Decreasing the meritocracy bias

Qualified lotteries weaken the meritocracy bias of competitive selections. They reduce the "fundamental attribution bias", the ignorance of "regression to the mean", as well as homophily and discrimination. The "fundamental attribution bias" refers to the tendency of people to overattribute outcomes to personal characteristics like talent or skill (Gilbert & Malone, 1995; Hiller & Hambrick, 2005). This effect is enlarged by the Matthew effect (see above) as well as by "great man theories "fostered by the media. Journalists tend to over-attribute a firm's actions and outcomes to its CEO (Meindl, Ehrlich, & Dukerich, 1985; Hayward, Rindova, & Pollock, 2004). To ignore "regression to the mean" is a common bias when evaluating performance: People tend to focus on extreme performers, neglecting that such performance usually is associated with extreme luck that is unlikely to persist (Kahneman, 2011: 185 ff.; Liu & De Rond, 2016; Mauboussin, 2012). Most people are hard to convince by statistical changes in performance. They tend to attribute success to skill and effort, and failures to misfortune. Lucky near-misses are often interpreted as success (Dillon & Tinsley, 2008).

With a qualified random selection, the meritocracy bias cannot be fully avoided. This bias in evaluating an individual's performance still plays a role in the preselection process. However, it can be weakened considerably by enlarging the size and the diversity of the pool of qualified candidates. Within the pool, random selection wipes out biases, noises, and other "bad reasons."

Enlargement of the pool of capable candidates

The larger the pool of candidates, the bigger the chance of reducing biases and other disturbances by random selection. This can be demonstrated with the example of the government of Basel in the 18th century. Before the introduction of the qualified lottery, nepotism was common. Candidates from long-established Basel elite families were five times more likely to be appointed to top positions—namely the admission to the important "Council of Thirteen"—compared to candidates from the non-elite. After the introduction of qualified random selection, the advantage of the elite eroded. However, it vanished completely only after the pool of candidates, out of which the lottery was drawn, was enlarged from three to six. Under this condition, outsiders could more than triple their election chances and the concerns of larger sections of the population were taken into account (Döhne, Geweke, & Rost, 2021).

In a laboratory experiment (Berger, Osterloh, & Rost, 2020), we were able to demonstrate with the example of women that not only more outsiders but also more high-performing outsiders apply for leadership positions. Compared to conventional procedures, the proportion of women competing for a leadership position tripled in qualified lottery procedures, and the proportion of high-performing women doubled. Qualified random selection thus closes the gender gap that persists in the competition for top positions.[16] This result may be generalized to other high-performing outsiders (Rost et al., 2021).

What is the theoretical explanation for this outcome? First, several studies show that individuals with elite backgrounds and insiders of the respective community are particularly open to risk taking (Stephens, Markus, & Townsend, 2007; Fiske & Markus, 2012; Kraus et al., 2012). In contrast, individuals with non-elite backgrounds and outsiders are less self-confident. Negative experiences with competitive performance evaluations lead them to view themselves as inferior. They are therefore less likely to apply in competitive selection processes (e.g., Niederle & Vesterlund, 2007). Randomness helps to reduce the psychic cost of risky decision making, and it protects from losing face when losing a competition. Second, outsiders are more influenced by negative feedback. They are more inclined to give up after a setback (Buser & Yuan, 2019). When the winner is determined mainly by chance the importance of negative feedback is reduced. Third, outsiders calculate correctly that they have a lower chance of success because they have the "wrong" background, the "wrong" taste, or the "wrong "gender. Evaluators are often biased by homophily and stereotypes. In addition, outsiders lack support from influential networks. Qualified random selection protects them from such forms of discrimination. Fourth, outsiders competing against powerful insiders run the risk of being considered not likable because they deviate from conventional social identity norms. This leads to public and private hostility and causes identity costs (Akerlof & Kranton, 2010). Many studies confirm that minorities—for example, women in male environments—anticipate these costs (e.g., Ridgeway, 2001; Eagly & Karau, 2002; Bertrand, Kamenica, & Pan, 2015).[17] Random selection reduces such identity costs because the success of outsiders cannot be attributed to deviation from social identity norms. Moreover, losers from influential ingroups do not lose face and therefore are less hostile to a winning outsider. Consequently, qualified lotteries reduce the barriers of entry for high-performing outsiders. The chance of selecting leaders of high quality into the "shortlist" increases.

Increasing diversity

In a conventional selection process, the better the preelection of candidates into a shortlist works, the more the skill differences between candidates are reduced. The attribution of expected performance to different candidates becomes harder. "Almost random careers" (March & March, 1977) might be the consequence.[18] The pool of candidates is likely to consist of individuals that are high in the required skill level but low in diversity. However, in an environment characterized by high complexity and "unknown unknowns," one does not know which qualities would be needed to cope with future problems. One does not know how to weigh different types of knowledge and experience or how to weigh professional performance compared to social behavior. Therefore, homogeneity should be avoided. Risk diversification is advantageous, just as in the long run passively managed diversified stock portfolios relying on random fluctuations of the stock market outperform active stock management (e.g., Barber & Odean, 2000). One should ensure that there are enough good but quite different stocks in the basket.

Qualified lotteries help to reach this goal in several respects. First—as shown in the previous section—focal random selections attract more diverse and more high-performing candidates than conventional procedures do, leading to a more diverse shortlist of high quality. Second, with a lottery, homophily and discrimination are avoided. Third, selection by lot does not only consider visible characteristics nor those currently on the political agenda, such as gender or nationality. Instead, there is a greater chance that aspects not previously considered will be adequately represented. As a consequence, there will be more openness to exploit uncertain events like serendipity effects (Merton & Barber, 2004; Osterloh & Frey, 2019). Resilience in face of fundamental uncertainty will be enlarged. The "diversity bonus" that can be reached by qualified random selection is most important if a leadership team must be selected. In this case, it is advantageous not only to recruit the allegedly "best" candidates into the preselected pool according to narrowly predefined criteria. These candidates are less likely to have perspectives and experiences that are uncommon (Liu, 2021).

Reducing hubris

Qualified random selection has the potential to increase the qualification of decision makers not only before but also after the appointment because it reduces hubris. This outcome was demonstrated in another laboratory experiment (Berger et al., 2020).

Hubris is defined as the abuse of power by overconfident individuals (Petit & Bollaert, 2012; Berger et al., 2020). Previous research has extensively analyzed the detrimental consequences of CEO hubris on corporate outcomes. CEOs afflicted by hubris pay high premiums for nonprofitable corporate acquisitions (Hayward & Hambrick, 1997; Billett & Qian, 2008;

Malmendier & Tate, 2008), invest in pet projects funded by internal cash flows (Malmendier & Tate, 2005), compensate themselves with salaries that the firm's performance does not justify (Billett & Qian, 2008), and demand rewards based on luck or factors beyond their control (Bertrand & Mullainathan, 2001). They often believe that they can break rules with impunity.

Hubris is triggered by competitive selection methods because overconfident persons tend to overattribute success to their disposition and underestimate the influence of situational forces and luck (Gilbert & Malone, 1995; Weber et al., 2001; Malmendier & Taylor, 2015; Liu & De Rond, 2016). They feel superior to others and see other individuals as means to satisfy their own ends (Keltner, Gruenfeld, & Anderson, 2003). If random selection, rather than individual performance, plays a role in deciding who gets an influential position, overconfident individuals are not confirmed in their belief that they are far above the average. Hubris is not activated.

In our laboratory experiment (Berger et al., 2020), three groups are compared: In the first group, the winner was determined by a performance test. In the second group, pure random selection was used. In the third group, the three best candidates in the performance test were first determined, and then the winner was selected by lot. It turns out that in the first group, that is, in the performance test, subjects overestimate themselves and abuse their power to a higher degree. In a dictator game, four out of 10 overconfident leaders of the first group take an antisocial decision, whereas only one of 10 overconfident leaders in the third group take an antisocial decision. Qualified aleatory recruitment can therefore mitigate hubris and the abuse of power.

Convexity in performance

Under certain circumstances, a power law may exist concerning the performance of decision makers though in general—as we have argued—this is not the case. Examples of a seemingly or real power law are the frequency of publication by authors in any given field, called Lotka's Law (Lotka, 1926), or citations in highly ranked journals (Osterloh & Frey, 2020). In these cases, a mathematical model based on Jensen's Inequality Theorem (Jensen, 1906; Goodall & Osterloh, 2016; Oswald, 2020) implies that a random selection of pre-chosen candidates for a leadership position is rational under the following conditions: (a) appraisers lack foresight about candidates' future performance, (b) the organizational benefits of leader performance are characterized by convexity or power law so that the best candidates produce far larger gains than moderate-quality candidates, and (c) there is a low percentage of bad apples in the pool. Although condition (a) is mostly fulfilled, it is unlikely that condition (b) is given. Because of the difficulties of measuring the individual performance of leaders, we do not know whether there is convexity in a leader's performance. Condition (c) can be fulfilled by announcing a qualified lottery. This encourages more high-profile candidates to apply, as well as careful preselection of candidates into the "shortlist." To summarize, convexity in performance may add to the advantages of qualified lottery under conditions hard to verify.

COMPARISON OF COMPETITIVE SELECTION PROCEDURES WITH QUALIFIED LOTTERIES

To compare qualified lotteries with competitive selection procedures based on a meritocratic concept, we distinguish two different applications of qualified lotteries practiced in the past: (1) random selection of individuals and (2) random selection of selection bodies, which in a second step determine the winner in a conventional, competitive election.

1. Selection of individuals

Qualified random selection of individuals was, as described above, often practiced in the past and is still used, for instance, to choose the Coptic pope (Shoucri, 1991), or in the event of a tie. This principle also has been applied to the selection of grants or stipends, for example, with the Swiss National Foundation (Bieri et al., 2021) or the German Volkswagenstiftung (2018). It has also been proposed for the selection of executive political positions and supreme court judges (Frey, 2020) or for enlarging the percentage of high-performing women applying for leadership positions (Berger, Osterloh, & Rost (2020). Compared to conventional competitive selections the following advantages and disadvantages must be considered.

The most important advantage of competitive selection procedures is that it is usually undertaken by experts or committees of experts who can evaluate the candidates. Examples are the selection of a CEO by the board or the selection of professors at universities. A second advantage is that competitive selections for candidates provide strong incentives to perform and to gain a high reputation. A third advantage is that this procedure is well known and generally approved.

However, expert decisions cannot avoid the meritocracy trap. Even experts are subject to cognitive biases and noise, extensively analyzed by Kahneman (2011) and Kahneman, Sibony, & Sunstein (2021). To reduce this problem, several measures on the individual and institutional levels have been proposed. To deal with cognitive biases such as the fundamental attribution bias, homophily, and the Matthew effect, the most important step is to be acutely aware of them. This means switching from "system 1" to "system 2" (Kahneman, 2011). "System 1" means "fast thinking" that is subdued to intuition and

therefore subject to many biases. "System 2" refers to "slow thinking" in which individual biases can be identified and avoided. Noise is more difficult to deal with. In contrast to biases, which are systematic and predictable, according to Kahneman, Sibony, & Sunstein (2021) noise appears randomly. Noise in performance evaluation and employee selection is very large. Following Murphy (2008: 151) "the relationship between job performance and ratings of job performance is likely to be weak or at best uncertain."[19] To mitigate noise Kahneman, Sibony & unstein (2021, chapter 24) suggest a mainly algorithmic procedure at the institutional level. It consists of three principles: The first principle requires decomposition into the presupposed competencies, for example, general cognitive ability, leadership, cultural fit, and role-related knowledge. The second principle demands independent judgment of the recruiters using structured behavioral interviews. The third principle suggests a delayed holistic judgment by a committee. This principle departs from the algorithmic procedure and allows some intuitive and interdependent judgment but only after all information has been considered.

These improvements mitigate the disadvantages of competitive selection procedures considerably, leading to a selection of highly skilled and motivated individuals. The better the improvements perform and the more elaborate they are, the more costly they become. To find out which mechanisms consciously or unconsciously discriminate against outsiders needs special effort and costly investigations.

Three additional problems remain. First, the diversity of candidates may suffer on the demand and supply side. On the demand side, an algorithmic approach tends to lead to a pool of candidates who meet the required competencies to a high degree. But this reduces skill differences among candidates and is likely to disregard the variety of competencies for situations that today are unthinkable—the "unknown unknowns." On the supply side, diversity suffers since—as we have argued above—the number of applicants and their heterogeneity is smaller than desirable, given an unpredictable future. Second, winning in a competitive selection process favors hubris, as demonstrated above. Third, the required competencies included in the selection algorithms may represent characteristics that exclude certain groups of people. In particular, a criterion like "cultural fit" may discriminate against outsiders of the respective community. This may even produce "racist algorithms" (Chander, 2016). The first and third problems could be alleviated by quotas introduced to raise diversity. However, quotas can take only into account known criteria rather than still unknown ones.[20] Moreover, quotas are unpopular. They reinforce negative stereotypes and sometimes lead to sabotage against the group to be protected (Leibbrandt, Wang, & Foo, 2018; Täuber, 2019).

These problems can be mitigated—as argued above—by qualified random selection. In addition, qualified lotteries often need fewer resources and time than competitive selection procedures (Buchstein, 2020).[21]

2. Selection of committees----------

The second application of qualified lotteries consists of the random selection of decision bodies, which in a second step choose the winner in a competitive election. This procedure was used in the past, for instance, in Venice with the election of the doge. Today the principle of a random selection of decision bodies is applied in various countries for the election of juries (see, e.g., Vidmar, 2000). This principle could be extended, for example, to election bodies for company boards or academic positions.

Competitive, nonrandom selection procedures of decision bodies as they prevail today have several advantages. First, they usually are exerted by experts (sometimes in the form of co-optation) or voting, often in a combination of both. Experts can competently assess the qualification of the candidates. Second, voting according to defined majority rules (from unanimity to simple majority) ensures that with the composition of the committee heterogeneous interests are considered (e.g., Binderkrantz, Munk, & Pedersen, 2015). Third, a qualified random selection of committees instead of individuals meets the taste of decision makers for discretion and empowerment (Zimmerman, 2000). This may lead to a greater acceptance of qualified lotteries.

However, there are some disadvantages of these nonrandom procedures. First, in accordance with what has been said above, expert decisions are subject to biases and noise. Second, experts may consciously or unconsciously be partisans when suggesting candidates. An extensive literature deals with the procedures of how to handle this problem. In particular, the question of who should be represented in a conventionally chosen committee is subject to perpetual disagreement. Examples are the composition of boards in Corporate Governance (e.g., Zingales, 1998; Hall & Soskice, 2001; Zeitoun, Osterloh, & Frey, 2014) or the composition of Supreme Courts (e.g., Bell, 2004). In all these cases, qualified lotteries could mitigate the problems when applied to committees. In addition, the population out of which the decision is composed is more heterogeneous, leading to a variety of views.

To summarize, when comparing qualified lotteries to nonrandom, competitive selection procedures of individuals or of decision bodies the following questions must be answered:

- How significant is the uncertainty of future challenges or "unknown unknowns"?
- How big is the danger of discrimination according to criteria like gender, race, and socioeconomic status that cannot be adequately captured by quotas?

- Which are the relative costs in terms of resources and time?
- Are the procedures considered legitimate by decision-makers and the population?

These questions can be answered only after knowing the specific circumstances.

LIMITATIONS

In addition to the problems mentioned in the previous section, the most important limitation refers to the low acceptance of random selection today compared to earlier times. This holds for the population at large and even more strongly for the decision-makers in power who often believe that they are able to make excellent decisions so that no "second-order rationality" is necessary. Future research should inquire about the reasons for the changes in legitimacy judgments—that is, judgments about the appropriateness and validity (Suchman, 1995) of random procedures.

Another limitation concerns the size of the pool out of which candidates are to be randomly chosen. When it is too narrow, the problems of low diversity and partisanship become more relevant. If the pool is too large, it is unlikely to find enough qualified candidates. This problem is aggravated as the pool of candidates must be fixed ex ante to prevent undue manipulation of candidates. More research is needed to determine an appropriate size of the shortlist under different conditions.

Moreover, a problem arises when not enough qualified candidates are found to fill the pool according to the ex ante fixed size. The most obvious solution would be to discontinue the procedure and reissue a call for tenders. But this could open the door for manipulations. This problem also exists with conventional selection committees. But with qualified lotteries, it is likely to be more severe, since there might be more people who mistrust the new procedure.

In addition, it is unclear who should select the selectors. This was indeed the major problem in the Italian republics applying qualified lotteries (Buchstein, 2009, chapter 3). Today, headhunters could overtake this task or assist the process. However, the relationship between the use of lotteries and the use of headhunters has to be clarified. Headhunters would have an even more challenging task than today. They would have to preselect a pool of candidates—the shortlist—who are more or less equally qualified but who at the same time differ in their characteristics.

Lastly, the question has been unanswered who should decide whether qualified lotteries should be applied and under which conditions. The history of lotteries reveals that this question is decided in a political process. A huge variety of political thought had an influence and still is relevant today (e.g., McCormick, 2006; Sintomer, 2011; Buchstein, 2020). Nowadays, to introduce qualified lotteries to fill political positions, a democratic procedure is necessary. For example, in Switzerland, a popular referendum was undertaken on the question of whether to introduce a qualified random selection of the members of the highest court. In firms, a resolution of shareholders would be appropriate. In the case of state universities, a law would have to be enacted. Further research is needed to study which conditions or incentives would be beneficial for different stakeholders to engage in this new procedure.

CONCLUSION

Qualified lotteries have extensively been used in history in many communities and for many different purposes. Today, they are rarely employed because an illusion of rational decision making prevails. Moreover, elites do not advocate it because they lose power by random procedures. In addition, random procedures have become unfamiliar and therefore tend to be rejected. This largely explains the resistance against the introduction of qualified lotteries. However, from an institutional governance perspective, qualified lotteries under certain conditions produce considerable advantages: They help to overcome biases and noise with decisions, raise the quality and diversity of the shortlist from which the decision makers are selected, and reduce the hubris of leaders. Insofar, they mitigate the meritocracy trap. Most importantly, they help to cope with future requirements still unknown today and thus enlarge resilience in the face of fundamental uncertainty. Thus, they contribute to a second-order rationality at the institutional level.

ENDNOTES

[1] Institutions according to North (1991) are the rules of the game in a society that structure political, economic and social interactions. Well-known institutional "rules of the game" concerning multi-actor decision making are markets, hierarchies, voting, or negotiations; see, for example, Dahl and Lindblom (1976) and Frey (1983).

[2] In history, random selection often was considered to manifest the will of God; see Buchstein (2020).

[3] Unability occurs in cases of fundamental uncertainty in the sense of Taleb (2007) or biases and noise in the sense of Kahneman, Sibony, and Sunstein (2021). "Biases" consist of systematic decision failures; "noise" consists of random differences in decision outcomes.

[4] This condition is added by Stone (2010). It occurs when decision makers suffer from the psychic costs of having to regret a wrong decision (Dwenger, Kübler, & Weizsäcker, 2014).

[5] Another form of qualified lottery—used for example for the distribution of scarce resources such as research grants or slots in high-ranked scientific journals—is a selection of those in the middle ground who are neither extremely good nor extremely bad. Those in the middle ground have to undergo a lottery to select those who will be successful (Osterloh & Frey, 2020). This form of qualified lottery has been put into practice by the Swiss National Foundation (Bieri et al., 2021) and by the German Volkswagen Foundation (2018).

[6] In ancient history, to cope with fundamental uncertainty was not important, since the concept was unknown.

[7] The *boulê* was a council of 500 citizens who prepared the general assembly of the people.

[8] Such an understanding emerged not until the 17th century (Hacking, 2006).

[9] In the community of Glarus those who were selected randomly had the right to sell their office (Rambert, 1889). This underpins that democratic participation was not an aim of qualified random selection at this time.

[10] "Sapere Aude" Latin for "dare to know."

[11] In Switzerland in November 2021, a popular referendum for a qualified random selection of the supreme court judges was rejected by the citizens, mainly because the government and all political parties have spoken out strongly against it.

[12] But see Frey (1969) and Stolz (1986).

[13] For an application of random selection to enlarge the representation of stakeholders in corporate governance see Zeitoun, Osterloh, & Frey (2014).

[14] For example, in the United States, the ratio between the remuneration of a top American CEO and a typical employee in 1965 was 20:1; in 2019, it amounted to 278:1. From 1978 to 2018, CEOs' remuneration increased by 1,008%, whereas wages of the typical employee increased by only 12% (Mishel & Wolfe, 2019). In Europe, the figures are similar, although less dramatic than in the United States (Osterloh & Rost, 2011).

[15] However, they find evidence that sport coaches matter for outcomes of team sports like football and hockey.

[16] The gender gap in competitiveness was demonstrated in the seminal paper of Niederle & Vesterlund (2007). It was and recently confirmed in a meta-analysis of 110 studies by Markowsky and Beblo (2022).

[17] See also Tinsley, Howell, and Amanatullah (2015).

[18] See also the empirical evidence provided by Ginsburgh and Weyers (2014).

[19] It is estimated that noise accounts for much more variance than does the performance of the person being evaluated; see Greguras et al. (2003).

[20] Nevertheless, a quota can even produce diversity concerning unknown criteria if it is big enough. This was empirically demonstrated with a quota of male teachers in Finland; see Schaede & Mankki (2022).

[21] This was the reason why the Swiss National Foundation introduced a qualified lottery system to select certain stipends. They had so many equally good proposals to evaluate that they found it too costly and unfair to differentiate between them; see Bieri et al. (2021).

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