# Equality of opportunity and luck: Definitions and testable conditions, with an application to income in France[☆]

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A B S T R A C T

We offer a model of equality of opportunity that encompasses different conceptions expressed in the public and philosophical debates. In addition to *circumstances* whose effect on outcome should be compensated and *effort* which represents a legitimate source of inequality, we introduce a third factor, *luck*, that captures the random factors whose impact on outcome should be *even-handed* for equality of opportunity to be satisfied. Then, we analyze how the various definitions of equality of opportunity can be empirically identified, given data limitations and provide testable conditions. Definitions and conditions resort to standard stochastic dominance tools. Lastly, we develop an empirical analysis of equality of opportunity for income acquisition in France over the period 1979–2000 which reveals that the degree of inequality of opportunity tends to decrease and that the degree of risk of income distributions, conditional on social origin, appears very similar across all groups of social origins.

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"The ownership of personal or material productive capacity is based upon a complex mixture of inheritance, luck and effort, probably in that order of relative importance"

Frank Knight, *The Ethics of Competition*, 1935

## 1. Introduction

Most economic analysis of inequality, theoretical and empirical, relies on the assumption that equality of individual outcomes (*e.g.* welfare, income, health) is *per se* a desirable social objective. This is sometimes criticized for standing at odd with both public perceptions of inequalities and some developments in modern theories of justice. According to this criticism, a distinction must be drawn between morally or socially justified and unjustified inequalities. This has led egalitarian philosophers such as Rawls (1971), Dworkin (1981a, 1981b), Sen (1985), Cohen (1989) or Arneson (1989, 1990) to claim that distributive justice does not entail the equality of individual outcomes but only requires that individuals face equal *opportunities* for outcome. Despite the growing political audience of this view, few economic analyses have tried to assess the extent to which equality of opportunity is empirically satisfied.[1] Two major issues are likely to account for this state of affairs. First, how should equality of opportunity be characterized? In fact, no consensus has been reached, neither in the philosophical nor in the public debates, regarding how opportunities should be defined and in what sense they should be considered equal. In this paper we offer a model of equality of opportunity that encompasses several conceptions expressed in these debates. Second, how can equality of opportunity be empirically assessed? This requires that the determinants of individual outcomes be taken into account. However, these determinants are never fully

[1] Roemer et al. (2003), O'Neill et al. (2000), Checchi et al. (1999), Benabou and Ok (2001), Bourguignon et al. (2007), Goux and Maurin (2003), Alesina and La Ferrara (2005) and Checchi and Peragine (2005) who analyze equality of opportunity for income and Schuetz et al. (2005) who examine educational opportunities are some of the exceptions.

observable. Hence, we analyze how the various conceptions can be empirically identified, given data limitations, and provide testable conditions for equality of opportunity. Lastly, we develop an empirical implementation of these conditions and examine the extent to which equality of opportunity is achieved in the distribution of income in France.

One important implication of the equal-opportunity view is that judgements about equality must take into account the determinants of individual outcomes. At least two sets of factors must be distinguished: on the one hand, factors that are considered a legitimate source of inequality; on the other hand, factors that do not appear as socially or morally acceptable. Following the terminology introduced in Roemer (1998), we refer to the former determinants as *effort* and to the latter as *circumstances*. As most authors would agree, the principle of equality of opportunity essentially requires, that, given individual effort, circumstances do not affect individual prospects for outcome, or to paraphrase Rawls (1971, p. 63), that individual with similar effort face "the same prospects of success regardless of their initial place in the social system". What factors should count as effort or circumstances is of course a crucial point from a normative perspective. For several authors, individual responsibility should be the relevant criterion and all factors beyond the realm of individual responsibility should count as circumstances. There remains, however considerable debates on this issue.

A prominent view in these debates is the one expressed by John Roemer in a series of contributions.[2,3] It claims that the definition of circumstances is a matter of political choice. Furthermore, once circumstances have been defined "by society"[4], remaining differences in individual outcomes should be considered the result of effort. Hence, the distinction between circumstances and effort turns into a dichotomic partitioning of the determinants of outcome. As a consequence, requiring that, for a given level of effort, circumstances do not affect individual prospects for outcome, implies that individuals with similar effort should have *equal* outcomes.

This dichotomic approach lies at the heart of most economic analysis of equality of opportunity. However, it does not fully account for the diversity of the determinants of outcome and leads to a specific conception of equality of opportunity. Assuming that society has agreed on a given set of circumstances does not imply that the remaining determinants will reflect individual responsible choice and should be treated as effort. In this respect, international attitudes surveys, such as the one summarized in Fig. 1, reveal two noteworthy differences across countries. Consider that "social injustice" captures inequalities arising from circumstances, as defined "by society". First, countries differ in their propensity to consider that bad economic outcomes reflect social injustice, which indicates that the definition of circumstances may vary across societies. Second, and more importantly, the figure also suggests that countries differ in their belief in the role of effort in shaping individual outcomes, over and beyond the influence of circumstances.[5] The assumption that the determinants of outcomes excluded from socially defined circumstances relate to individual effort provides a good approximation of US average beliefs. It does not however correspond to the social perception in many European countries, which emphasizes the role of luck in shaping individual success.

Our purpose is to build a model of equality of opportunity flexible enough to encompass this diversity of perceptions. This requires to distinguish three *generic* determinants of individual outcomes: circumstances, effort and luck. As described in the philosophical literature,
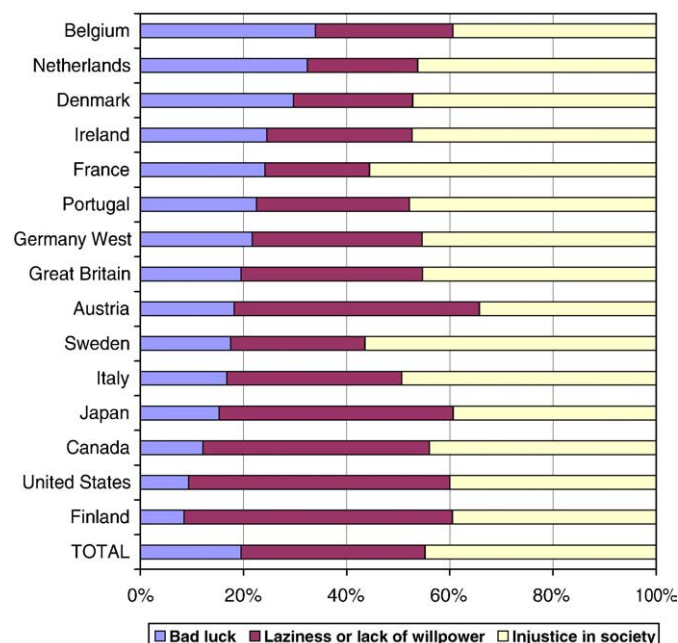
[2] For a theoretical discussion, see Roemer (1993, 1998) and for empirical applications Betts and Roemer (2006), Roemer et al. (2003) and Dardanoni et al. (2005).
[3] See Fleurbaey and Maniquet (2007) for a thorough discussion of alternative perspectives and related issues.
[4] Roemer (1993, p. 149).
[5] For more detailed evidence, see among others Marshall et al. (1999), Corneo and Gruner (2002), Alesina and Glaeser (2004) and Alesina and Angeletos (2005).

**Fig. 1.** Beliefs in the role of luck, effort and social injustice in bad economic outcomes. Source: World Values Survey (1990). Answers to the question: "Why are there people living in need?". Authors' computations excluding the following answers: It is an inevitable part of modern progress; None of theses; Don't know.

justice does not necessarily command that the impact of every kind of luck be nullified. In some cases, luck may appear as a fair source of inequality provided that it is decorrelated from circumstances, in short, even-handed. Consequently, it is too strong a requirement to define equality of opportunity as a situation where individuals with similar effort reach equal outcomes. What equality of opportunity requires is that, given effort, no one faces more favorable outcome prospects, as a result of luck, for reasons related to differential circumstances.

The first contribution of this paper is to offer a characterization of equality of opportunity consistent with this view. Given effort, the outcome prospects of an individual are summarized by the outcome distribution conditional on her circumstances. Our characterization rests on the idea that equality of opportunity prevails when the conditional outcome distribution attached to all possible circumstances cannot unanimously be ranked in terms of well-being, using the tools of stochastic dominance (first and second orders). The introduction of luck as a determinant of outcome fully legitimates the use of stochastic dominance instruments, and specifically of second order. Because choosing among the outcome prospects falls down into decision-making problems under risk. If a decision maker is unable to choose among the different prospects, then EOP prevails. This leads us to distinguish several definitions of EOP.

The empirical implementation of these definitions of equality of opportunity would be straightforward if circumstances and effort were observable. However, in practice, this condition may not be easily met. In most data sets, not all the relevant aspects of individual effort can be measured and only a subset of the relevant circumstances can be observable. We discuss the consequences of these limitations for the evaluation of equality of opportunity. The second contribution of the paper is to show that, conditional on further distributional assumptions, it is still possible in some cases to provide testable conditions for equality of opportunity when effort and circumstances are not fully observed.

We then develop an empirical analysis of equality of opportunity for income acquisition in France, using household surveys over the period 1979–2000. In this application, we assume that circumstances are defined by individual social background, measured by father's occupation and we compare income distributions conditional on