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The perception of inequality of opportunity in Europe

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Abstract

Does the way scholars measure inequality of opportunity correspond to how people perceive it? To answer this question we must first clarify how scholars define and measure inequality of opportunity, we will then discuss the possible mechanisms link- ing objective measures and subjective perception of the phenomenon, and finally we test our hypothesis by merging data coming from two sources: the European Union Statistics on Income and Living Conditions (2011) and the International Social Survey Programme data (2009). We show that individual perception of unequal opportunity is heterogeneous across countries and among individuals. Moreover, the prevailing perception of the degree of unequal opportunity in a large sample of respondents is only weakly correlated with its objective measure. We estimate a multilevel model considering both individual and country level controls to explain individual perception of unequal opportunity. Our estimates suggest that one of the most adopted measure of in- equality of opportunity has no significant role in explaining its perception. Conversely, other country level variables and personal experiences of intergenerational social mobility are important determinants of how inequality of opportunity is perceived.

Keywords

Introduction[1]

Equality of opportunity is an increasingly considered topic in economics. In 2015 both the Handbook of Income Distribution (Atkinson & Bourguignon, 2015) and the Oxford Handbook of Well-Being and Public Policy (Adler & Fleurbaey, 2015) devote more than one chapter to different aspects of equal opportunity. The way economists understand and measure inequality of opportunity today is rooted on a debate involving political philosophers and theoretical economists about the egalitarian paradigm. Since the seminal contributions by Rawls in the early '70s, a number of authors have attempted to revise the egalitarian paradigm proposing alternative spaces upon which equity should be implemented. Dworkin (1981a, b) suggested that the object of equalization should be individual resources endowment rather than achievements. Arneson (1989) and Cohen (1989) explicitly introduced the idea of responsibility as a source of ethically inoffensive inequality. For all these authors the society should remove inequality arising from factors influencing individual's outcome for which she cannot be held responsible (Ferreira & Peragine, 2015). Roemer (1998) proposed a definition of equal opportunity in which individuals exerting the same effort are entitled to obtain the same outcome and any inequality due to circumstances beyond individual control should be removed.

More recently Fleurbaey (2008) introduced a framework in which preferences partici- pate together with resources to determine the level of individual welfare. If one agree that individuals can be held responsible for their preferences and choices this framework can be used to define and measure equality of opportunity. The most commonly proposed definitions of equality of opportunity are based on two norms: the principle of compensation, which states that inequality due to circumstances beyond individual control is inequality of opportunity, and the principle of reward, which states that inequality due to choice and effort is not. Different definitions of equality of opportunity originates from the way the two principles are balanced (Fleurbaey, 2008). In the recent years a vast range of definitions of equal opportunity, most of them have been translated into measures of inequality of opportunity, employed in a growing empirical literature. However, whether those definitions

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correspond to how people understand and perceive inequality of opportunity remains an unanswered question.

A natural starting point for our investigation is the literature on the perception of in- equality, after all, inequality of opportunity is a particular type of inequality. The public opinion about the level of inequality in a country is relevant because it can influence individual behaviours. Perceived increasing inequality can modify electoral results or even trigger unrest, as it was suggested for Egypt and other countries involved in the Arab Spring (Verme, 2013). Nevertheless, very few authors have explicitly discussed the relationship between measured inequality and the general perception of inequality. According to Runcinam (1966) inequality is perceived and suffered as relative deprivation: individuals com- pare their outcome such as income, consumption or wealth, with the outcome of a reference group, their feeling of deprivation is an increasing function of the number of individuals having more than them. If this is the case, as shown by Yitzhaki (1979), the Gini index should correctly aggregate the total perceived deprivation. Therefore, we should expect a strong correlation between perceived inequality and inequality measured by the Gini index. However, a number of recent empirical contributions in psychology and economics have shown that the perception of inequality reported by people in opinions survey does not correspond to income inequality as it is commonly measured (Chambers et al., 2014; Cruces et al., 2013; Gimpelson & Treisman, 2015; Nor- ton & Ariely, 2011; Verme, 2013). Other contributions have shown that a society's structure can be perceived to be considerably less equitable than it really is (Niehues, 2014). Finally, Keller et al. (2010) comparing 27 European countries suggest that the correlation between measures of inequality and perception of inequality is stronger for measures of poverty than for measures of inequality.

It is important to note, however, that the preponderance of the economic literature that has investigated this topic has not focused on the factors explaining the perception of in- equality. Perceived inequality has, instead, been generally considered to be an exogenous explanatory variable of the citiziens attitude toward redistribution. Beside the classical me- dian voter theory, in which the voters attitude is determined solely by their position in the income distribution, the "tunnel effect" theory - described by Hirschman and Rothschild (1973) - suggests a role for expectations: inequality in the short run can be positively perceived even by worse off individuals because it could be interpreted as a signal of future general improvement. Similarly the "prospect for upward mobility" hypothesis - theoretically

investigated by Benabou and Ok (2001) - suggests that when expecting upward mobility even individuals with an income below the median will oppose progressive redistributive policies.

In discussing this mechanism these contributions have often introduced the idea that the degree of equal opportunity and social mobility is crucial in determining the acceptability of inequality. According to Piketty (1995) this idea date back to De Tocqueville (1835) who suggested that different rates of social mobility in the United States and Europe could explain the differing attitudes toward redistribution. This point of view is shared by a number of authors that have explained different attitudes toward inequality in the two continents by reference to the difference in popular beliefs about the degree of social mobility (Lipset & Bendix, 1959; Alesina & La Ferrara, 2005; Alesina & Angeletos, 2005). A similar explanation has been proposed by Whyte (2010) and Lu (2012) in discussing the reaction to growing inequality in China, and also by Gimpelson & Monusova (2014) in relation to a large sample of countries. According to these theories, perceived inequality depends on the difference between what individuals feel entitled to obtain and what they have obtained, or expect to obtain in the future.

Again, these contributions have considered the perception of equality of opportunity and social mobility owing to exogenous factors and have included them among the variables explaining peoples attitudes toward inequality and redistributive policies. In what follows we endeavor to take a step back and seek instead to explain how the perception of equality of opportunity is formed and further, to explain the relationship between this perception and the actual degree of equality of opportunity in a given society. Very few sociological contributions have attempted to shed light on how the individual perception of social mobility is formed (Webb, 2000; Attias-Donfut and Wolff, 2001). Pasquier-Doumet (2005) represents the only contribution focusing on the perception of inequality of opportunity. Her analysis is based on a rich questionnaire of semi-open questions asked to a sample of 100 individuals in Lima. Unfortunately Pasquier-Doumet (2005) is a descriptive working paper, never published, which nevertheless contains a number of interesting research starting points.

We will assume that for the public opinion the term equality of opportunity is un- ambiguous: inequality of opportunity is inequality due to circumstances beyond individual control, while inequality due to choice and effort is not. Under this assumption, how do individuals quantify the degree of equality of opportunity in their country? Are they able to quantify the effect of circumstances beyond individual control on the distribution of out- comes?

The simplest possible approach to answer this question is to impose a further assumption: that individuals are able to quantify the relative role of effort and circumstances in determining success in life. If this is so, we should expect a strong correlation between measured and perceived inequality of opportunity. Of course, individual perceptions may be imprecise because inequality of opportunity is a complex phenomenon. In order to formulate an opinion as to the degree of inequality one must first ascertain the average effect that choices and circumstances have on outcomes. Then, to judge the intensity of the phenomenon, one must compare inequality caused by circumstances in a particular country against some benchmark, for example by making a comparison with the same phenomenon in other countries. Individuals will inevitably make mistakes while undertaking this complicated process of reasoning. However, if the expected value of the error is zero and errors are not correlated within and between individuals, the distribution of perception among a large sample of individuals will be approximately normally distributed around the objective measure of inequality of opportunity.

However, it must also be acknowledged that individual perceptions may be influenced by other factors and their aggregation may be less straightforward where this occurs. A case in point would be where a country's institutional characteristics, for example, its fiscal system, affect public perception. In such cases we will find individuals perception to be downward biased or upward biased depending on the fiscal system in place in their country. Moreover, a plausible hypothesis is that perceptions of the relative importance of exogenous circumstances are shaped by personal experiences. Assuming that people can at least identify where they stand in respect of income distribution and their exogenous circumstances, we are left with the problem of understanding how individuals quantify the causal contribution of innate characteristics to this outcome.

The economic literature is silent on this issue, but there is extensive literature in field of social psychology considering how individuals explain or attribute causes to outcomes. Since Fritz Heider's seminal contributions, the attribution theory represents the main theoretical framework to explain the processes by which individuals attribute causes to events and behaviours (Weimer, 1974). According to this theory attribution can be internal, if people consider that an event is due to individual characteristics such as traits or feelings, or external if people consider the event occurs as a result of situational factors beyond individual control.

According to Weimer, attribution can also be classified by other two causal dimensions: stability and controllability.

In this literature a number of empirical contributions have shown the presence of bias in the perceptual process, especially when individuals make causal inferences with regard to personal outcomes (Miller & Ross, 1975; Russell, 1982). According to these authors, a self-serving bias operates when individuals formulate attributions about the causes of personal successes and failures, distorting the cognitive process in order to maintain self-esteem. When explaining a success individuals tend to emphasise the role of internal causes. Causes of failures instead tend to be perceived as more external and uncontrollable. This point is particularly relevant for our analysis. When asked about the role of circumstances beyond individual control in determining success in life, interviewees may formulate a judgment based on experiences of success and failure familiar to them. In so doing, their own experience may be disproportionately weighted. Therefore, owing to this self-esteem bias, we no longer expect the perception of inequality of opportunity to be distributed around its objective measure. On average, individuals who perceive their life as a story of success will tend to understate the role of external conditions in determining outcomes and by extension they will underestimate the degree of inequality of opportunity in their country. Conversely, individuals who perceive their life experiences to be failures will tend to overemphasise the importance of circumstances beyond individual control, that is to say that they will overestimate the degree of inequality of opportunity.

The remaining of this paper is organised as follows: Section 2 introduces the concept of equality of opportunity and one of the most widely adopted approach to measure it. Section 2 contains a description of the data and presents estimates for inequality of opportunity and its perception in 20 European countries. In Section 4 we empirically investigate two aspects of the inequality of opportunity perception: i) is the prevailing perception of inequality of opportunity in a given country close to its estimate? ii) What other factors influence the individual perception of the degree of equal of opportunity? Section 5 concludes.

2. Inequality of Opportunity

A precise definition of what we mean when we talk about inequality of opportunity is a precondition for our analysis. Inequality of opportunity and social mobility have been at the centre of the research agenda in sociology and economics for at least four decades and a number of definitions, to a large extent overlapping, have been proposed in both disciplines.

Recent economic literature addressing the measurement of inequality of opportunity has grown from early work by van de Gaer (1993) and Roemer (1998). As already mentioned a vast range of definitions and measures have been proposed and implemented in the last two decades, the most prominent theoretical definitions in the literature have been recently summarized by Ferreira & Peragine (2015) and Roemer & Trannoy (2015), a survey of the empirical approaches to measure inequality of opportunity can be found in Ramos & Van de gaer (2012), a meta analysis of the existing evidences is proposed by Brunori et al. (2013).

In what follows we adopt the simple framework introduced by Checchi and Peragine (2010) to measure inequality of opportunity.

The conceptual basis for the definition of inequality of opportunity is provided by the distinction between individual efforts and pre-determined circumstances. This approach considers that inequality due to the former is not ethically offensive, whereas it suggests that differences in individual outcome due to the latter represent a violation of the principle of equality of opportunity and should be removed.

Equation (1) is the simplest possible model to study inequality of opportunity: individual desirable outcome (y_i) is obtained as a function of two sets of traits: circumstances beyond individual control *(c = c_1,...,c_k)* and choice *(e = e_1,...,e_j)*.

$$y_i = f(c_k, e_j) \tag{1}$$

Inequality of opportunity is identified as the inequality owing to circumstances beyond individual control. In the literature, circumstances beyond individual control include all observable exogenous characteristics such as parental education, parental occupation, sex, and race. Because inequality due to choice or effort is generally unobservable it is obtained residually. To assess the degree of inequality of opportunity (the severity of the violation of

equality of opportunity) we need a meaningful decomposition of total inequality (*I(y)*) which will allow us to separate inequality due to circumstances (*IOp(y)*) and inequality due to effort (*IOe(y)*).

Unfortunately, a clear distinction between the two components of inequality is generally impossible but in the very unlikely case of constant effect of circumstances on outcome for different effort levels. Whenever the unfair advantage of a circumstance is a function of the effort exerted it becomes impossible to distinguish the share of inequality due to opportunity from the residual inequality due to choice. This impossibility stems from the tension between the principle of compensation and the principle of reward and is well known in the literature on fair allocation (Fleurbaey, 1995; 2008) and on the measurement of unfair inequalities (Fleurbaey & Shockkaert, 2009; Fleurabey & Peragine, 2011). Due to this tension any measure of IOp can be fully consistent with one of the two principles but only partially satisfies the other. In what follows we adopt a decomposition of total inequality fully consistent with the principle of compensation which was proposed by Checchi and Peragine (2010) and has been adopted in the empirical literature.

To obtain such a decomposition of total inequality we first partition the entire population into groups, called types, each type includes all individuals characterised by the same circumstances. For example, a hypothetical country characterised by two circumstances, sex and race, will be partitioned in four types: black men, black women, white men, white women. Then following Roemer (1998) we assume that effort (*e*) is orthogonal to circumstances (*c*), that is, any inequality correlated with circumstance is inequality due to opportunity. Under this assumption the degree of effort exerted by an individual can be measured as her position in the type specific distribution of outcome. Individuals sitting at the same quantile of the outcome distribution of different types are assumed to have exerted the same degree of effort. For example, a black woman sitting at the top decile of her type specific income distribution is considered to be exerting the same degree of effort of a white man in the richest 10% of his type specific income distribution. Our original distribution of income is now twice partitioned: in types (individuals affected by different circumstances) and in quantiles (made of individuals that exerted same degree of effort). We can now measure IOp as inequality between types and IOe as inequality between quantiles. To obtain this decomposition there are a number of methods which unfortunately lead to different IOp

estimates (Fleurbaey, 2008; Ferreira & Peragine, 2015). Again, here we follow the popular approach proposed by Checchi & Peragine (2010).

We consider inequality between quantiles as legitimate because this is due to effort whereas inequality within quantiles to be inequality of opportunity. Therefore we modify the original distribution of incomes: we first replace the individuals' income of those sharing same circumstances and same degree of effort with their mean income of (μ_k^j), then we divide types' mean by the mean of their quantile (μ^j) multiplied by the populations average income (μ). This transformation removes all inequality between quantiles (and within types) and leaves intact inequality within quantiles. Inequality in this counterfactual distribution is therefore IOp and the remaining is IOe.

$$\text{IOp} = I \left[(\mu_k^j / \mu^j) \, \mu \right] = I(y^c) \qquad (2)$$

However, not all circumstances are observable therefore, *IOp* is interpreted as a lower bound estimate of inequality due to opportunity in the distribution of *y*. For our purpose this measure of *IOp* has two important features: it is a largely adopted in the relevant literature and has an intuitive meaning. The second property is crucial in this context because we aim to precisely compare measures and perceptions of the phenomenon. More sophisticated measures of inequality of opportunity may be much more distant from the intuitive meaning of the term[2].

3. Inequality of opportunity and perceived inequality of oppor- tunity in 22 European countries

In what follows we will empirically investigate these two issues: i) is the prevailing perception of inequality of opportunity in a given country close to IOp estimate? ii) What other factors influence the individual perception of the degree of equal of opportunity? To achieve an answer we first measure *IOp* in a sample of countries and we compare these estimates with the prevailing perception of the phenomenon in the public opinion. We then

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[2] For example, as shown by Brunori and Peragine (2011), the compensation-consistent measure proposed by Checchi and Peragine (2010) is virtually never consistent with the principle of reward. One therefore may consider a measure such as the fairness gap introduced by Fleurebaey and Schokkaert (2009) a preferable measure of IOp because it has the property of being also consistent with the reward principle for a reference circumstance. However, we consider the measure proposed by Checchi and Peragine more intuitive because of its reference to averages

investigate what factors distort the individual perception of *IOp* estimating a regression model which includes a number of country level and individual level controls.

The data requirements for studying the relationship between *IOp* and its perception are rather demanding. One requires both information on public opinion and a precise record of incomes and individual circumstances. These two types of information are rarely contained in a unique dataset. We therefore merge information from two sources: the International Social Survey Programme (ISSP 2009) and the European Union Statistics on Income and Living Conditions (EU-SILC 2011). Although the first survey contains opinions recorded in 2009 and the second contains incomes earned in 2010, we consider the two surveys as if they were conducted simultaneously. This small asynchrony may be ignored because the phenomena we are dealing with are measured and judged in a time horizon of two generations. Conversely, the fact that ISSP was conducted in the aftermath of the Great Financial Crisis (2007-08) is a potential threat for the external validity of our analysis. It may be possible that individual perceptions have been modified after a shock that has reduced expectations for future growth at least in the richest economies.

Given the large overlap of the two samples we are able to study a subsample of 20 European countries included both in EU-SILC 2011 and ISSP 2009: Austria (AT), Bel- gium (BE), Bulgaria (BG), Cyprus (CY), Czech Republic (CZ), Denmark (DK), Estonia (EE), Finland (FI), France (FR), Germany (DE), Hungary (HU), Latvia (LT), Norway (NO), Poland (PL), Slovak Republic (SK), Slovenia (SI), Spain (ES), Sweden (SE), Switzerland (CH), United Kingdom (UK).

To identify the determinants of *IOp* perception we use opinions recorded in the ISSP 2009. ISSP 2009 contains information about how social mobility and equality of opportunity are experienced and perceived together with a number of individual level covariates. Descriptive statistics of the average values of respondents characteristics in the 20 samples are reported in Table 1.

The data needed to measure IOp is a representative survey of individuals containing in- formation about: income, socioeconomic background, country of origin and possibly all the other circumstances beyond individual control that play a role in determining income. Although ISSP 2009 contains all these variables, because its sampling strategy is constructed

to correctly represent opinions it cannot be considered sufficiently reliable to estimate other phenomena such as the income distribution.

Table 1: ISSP descriptive statistics

country	sample	male	age	urban	degree	student	worker	unemployed	retired	down. mob.	up. mob.
AT	1,019	0.47	46.16	0.32	0.2918	0.0719	0.5494	0.0530	0.2811	0.2063	0.3814
BE	1,114	0.49	49.07	0.21	0.6196	0.0623	0.5379	0.0371	0.2606	0.2166	0.3552
BG	983	0.48	47.51	0.47	0.7379	0.0455	0.5143	0.1173	0.2757	0.1782	0.3594
CH	1,227	0.46	48.51	0.26	0.3453	0.0517	0.6265	0.0228	0.1706	0.2264	0.4260
CY	1,000	0.49	42.62	0.53	0.7410	0.0820	0.6920	0.0230	0.0970	0.2250	0.3970
CZ	1,190	0.50	45.11	0.36	0.3820	0.0965	0.5175	0.0665	0.2261	0.2685	0.2931
DE	1,391	0.50	49.32	0.30	0.2890	0.0503	0.5313	0.0568	0.2782	0.2566	0.3537
DK	1,405	0.48	49.88	0.41	0.8683	0.0669	0.6014	0.0263	0.2263	0.1779	0.4505
EE	1,004	0.45	46.43	0.50	0.7484	0.0652	0.5409	0.0789	0.2015	0.2408	0.3124
ES	1,209	0.49	46.25	0.27	0.4530	0.0512	0.4102	0.1822	0.2071	0.1984	0.4319
FI	857	0.50	44.04	0.48	0.5709	0.1187	0.5721	0.0599	0.1741	0.2015	0.4314
FR	2,804	0.48	48.03	0.23	0.5399	0.0572	0.5735	0.0399	0.2813	0.2460	0.4455
HU	1,007	0.47	47.15	0.39	0.4343	0.0510	0.4698	0.0769	0.3286	0.2296	0.2968
LT	1,069	0.39	44.36	0.48	0.7755	0.0786	0.5669	0.0702	0.2011	0.2591	0.2806
NO	1,355	0.49	47.61	0.41	0.8185	0.0568	0.7100	0.0103	0.1277	0.1956	0.4177
PL	1,256	0.48	44.76	0.30	0.5963	0.0797	0.5377	0.0850	0.2491	0.3142	0.4013
SE	1,111	0.48	48.29	0.42	0.5374	0.0720	0.6805	0.0378	0.1683	0.2304	0.4203
SI	1,029	0.46	46.56	0.26	0.5675	0.1118	0.5345	0.0603	0.2546	0.2527	0.3052
SK	1,152	0.47	44.06	0.18	0.4548	0.0937	0.5013	0.0869	0.2172	0.2580	0.3585
UK	830	0.48	47.71	0.34	0.4521	0.0171	0.5977	0.0609	0.2119	0.2464	0.4044

Source: Author' calculation based on ISSP, 2009. Descriptive statistics are calculated using sample weights where available.

In particular, comparing the household income variable - the outcome of interest in this analysis - with official estimates we have found systematic inconsistencies. We therefore estimate *IOp* for the sample of European countries exploiting the Survey on Income and Living Conditions, (EU-SILC). EU-SILC is a reliable source for the analysis of the income distribution. Moreover, it has been already utilised by a number of authors in the study of equality of opportunity. The wave collected in 2010 contains a module about intergenerational transmission of disadvantages which includes information about socioeconomic background. We follow other contributions by limiting our analysis to a subsample of respondents: working age adult individuals aged between 25 and 65 (Marrero & Rodrguez, 2012; Checchi et al, 2015). We implement a non-parametric approach to estimate IOp, this identifying groups of individuals sharing same circumstances and then partitioning each group into three income quantiles. This procedure is demanding in term of sample size

and forces us to consider only three circumstances beyond individual control: parental education, parental occupation and gender, Table 6 in the Appendix re- ports the distribution of circumstances across countries. *IOp* is then calculated as the mean logarithmic deviation applied to the counterfactual distribution (y^c) where the outcome *y* is the household income divided by the square root of the number of household components[3]. Other contributions identify individual outcome with earnings or - especially in poorer countries - with per capita consumption, we prefer to use equivalent income which allows us to include in the analysis all individuals without individual earnings which nevertheless benefit from a positive income. Table 2 reports the sample size, mean income, total inequality, and *IOp* (both in levels and as share of total inequality).

Table 2: EU-SILC descriptive statistics

country	sample	mean income	inequality (Gini)	inequality (MLD)	IOp (MLD)	IOp (%)	GDP	GDP growth (%)
AT	6,686	25,110	0.2667	0.1277	0.0034	2.64	35,200	1.11
BE	6,025	22,950	0.2572	0.1263	0.0076	5.98	33,600	1.09
BG	7,398	9,963	0.3337	0.2057	0.0330	16.04	4,900	1.61
CH	7,322	24,177	0.2794	0.1409	0.0058	4.09	55,700	1.10
CY	5,188	27,475	0.2783	0.1365	0.0061	4.48	23,000	1.12
CZ	7,220	13,727	0.2607	0.1200	0.0072	5.98	14,900	1.34
DE	12,185	24,154	0.2904	0.1420	0.0031	2.21	31,500	1.10
DK	2,784	23,155	0.2640	0.1569	0.0008	0.54	43,500	1.03
EE	5,485	11,406	0.3224	0.1993	0.0077	3.87	11,000	1.46
ES	16,104	18,022	0.3221	0.2101	0.0097	4.63	23,200	1.08
FI	5,170	22,796	0.2647	0.1168	0.0017	1.44	34,900	1.14
FR	11,536	23,839	0.2989	0.1573	0.0071	4.54	30,800	1.06
HU	14,327	11,382	0.2754	0.1277	0.0157	12.29	9,800	1.25
LT	5,384	9,410	0.3319	0.2151	0.0056	2.62	9,000	3.39
NO	2,752	29,606	0.2320	0.0951	0.0017	1.80	66,200	1.07
PL	15,606	12,151	0.3141	0.1776	0.0099	5.60	9,300	1.46
SE	1,143	20,045	0.2394	0.1072	0.0027	2.53	39,400	1.17
SI	5,243	17,026	0.2577	0.1020	0.0060	5.90	17,700	1.26
SK	7,562	13,162	0.2646	0.1329	0.0047	3.56	12,400	1.59
UK	6,598	21,716	0.3244	0.1868	0.0079	4.24	28,900	1.11

Source: Author' calculation based on EU-SILC (2011) and Eurostat (2015). Equivalent income and GDP per capita are expressed in euro PPP ESA 2010. Average equivalent income and total inequality (Gini) are calculated on the entire sample, IOp is calculated on the subsample made of working age individuals.

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[3] Although other inequality measures, such as the Gini, are used to measure IOp, the mean logarithmic deviation has been traditionally adopted because of its perfect and path independent decomposability into between and within groups (Checchi and Pragine, 2010).

IOp varies between 0.0008 (0.53% of total inequality) in Denmark and 0.0330 (16.04%) in Bulgaria. The last two columns in Table 2 reports per capita GDP and average per capita GDP growth rate in the 1999-2009 decade. Our estimates in Figure 1 show the well known positive relationship between total inequality and inequality of opportunity (Corak, 2013) and a lower level of equality of opportunity for Mediterranean and transition economies.

Figure 1: Inequality and relative IOp
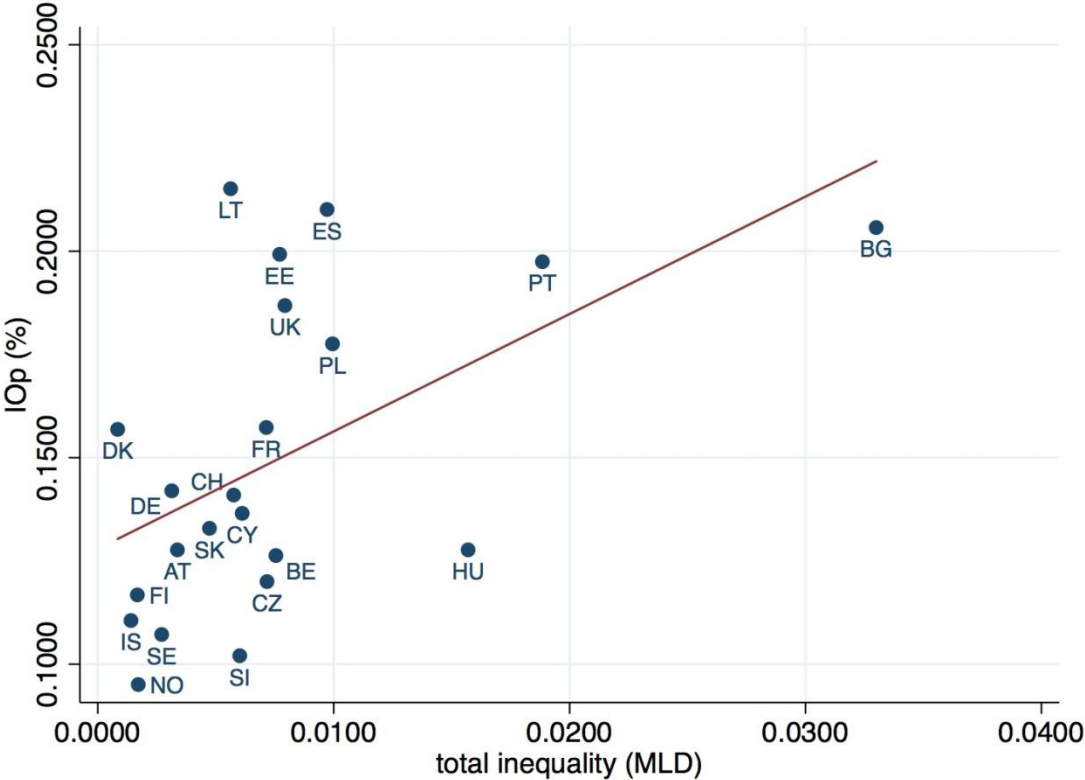
Source: EU-SILC (2011). Inequality of opportunity is the share of total inequality due to exogenous variables (IOp in eq. 2).

3.1 *Perception of inequality of opportunity*

Equality of opportunity combines two principles: the principle of compensation and the principle of reward. According to the principle of compensation, inequality is unfair when arises from circumstances beyond individual control e. g. socioeconomic background, gender, race. The principle of reward states that whenever inequality is the result of choices and effort

it is legitimate. The combination of these two principles is the theory of equal opportunity (see Fleurbaey (2008) for a discussion). In the absence of a survey question such as "what is the degree of equal opportunity in your country?" we combine the answer to a number of questions that we believe capture the perception of the phenomenon. From the ISSP questions about the importance of different individual characteristics for getting ahead in life we select the following:

1. coming from a wealthy family?

2. knowing the right people?

3. a person's race?

4. a person's religion?

5. being born a man or a woman?

6. having ambition?

7. hard work?

Possible answers are: 1=essential, 2=very important, 3=fairly important, 4=not very important, 5=not at all important.

The first five questions measure the perceived violation of the principle of compensation: if the respondent identifies family wealth, religion, race, or gender, as important characteristics for success in life then the degree of equal opportunity she perceives is low. The latter two questions measure to what extent the principle of reward is perceived to be satisfied: the more hard work and ambition are considered important determinants of success the higher the degree of perceived equal opportunity. Table 3 reports the share of respondents that considered each determinant at least very important to get ahead in life. The picture we get is very heterogeneous and contains a number of interesting outliers. A low number of respondents consider family wealth to be at least very important, in transition economies (21% in Bulgaria and Poland) while the highest percentage is interestingly found in Fin- land, the country with the third lowest IOp in our sample. Connections are considered at least very important by almost 40% of the French interviewees but by less than 6% of the Polish and

Slovak respondents. Race is considered to be at least very important by over the 70% of the Estonian and 78% of the Latvian respondents[4].

Table 3: Determinants to get ahead in life: share of respondents answering 'essential' or 'very important'.

country	family wealth	connections	race	religion	gender	ambition	hardwork
AT	0.3008	0.0826	0.5374	0.6835	0.5321	0.7487	0.6696
BE	0.4692	0.0842	0.5560	0.7194	0.6647	0.5458	0.6403
BG	0.2153	0.0708	0.5360	0.6174	0.5233	0.8454	0.8029
CY	0.3480	0.2220	0.6380	0.6900	0.7280	0.8410	0.8800
CZ	0.4613	0.1344	0.5276	0.8038	0.5462	0.6661	0.7447
DK	0.5501	0.2055	0.6653	0.7022	0.6963	0.6001	0.4065
EE	0.3270	0.1155	0.7096	0.8797	0.7676	0.4613	0.6822
FI	0.6670	0.2424	0.6463	0.8064	0.7234	0.5026	0.6239
FR	0.6158	0.3932	0.6466	0.8312	0.6974	0.6066	0.5336
DE	0.3563	0.0674	0.5419	0.7792	0.6122	0.7799	0.6975
HU	0.2520	0.1465	0.4066	0.7568	0.5254	0.7659	0.7077
LT	0.2816	0.1328	0.7848	0.8868	0.7212	0.5575	0.7624
NO	0.4966	0.1951	0.4238	0.6827	0.6058	0.8207	0.7589
PL	0.2109	0.0566	0.6938	0.6840	0.5617	0.9132	0.8494
SK	0.3046	0.0559	0.5870	0.7022	0.5604	0.7303	0.7521
SI	0.3277	0.0610	0.6535	0.7099	0.5437	0.7174	0.7099
ES	0.3773	0.1190	0.6336	0.7806	0.6393	0.5634	0.6765
SE	0.5057	0.1671	0.6157	0.7001	0.6157	0.8197	0.7353
CH	0.6168	0.1211	0.6394	0.7884	0.6138	0.6285	0.6690
UK	0.5009	0.1885	0.6028	0.6811	0.6321	0.6138	0.7216

Source: Author' calculation based on ISSP, 2009. Share of answers are obtained using sample weights when available. Possible answers: 1=essential, 2=very important, 3=fairly important, 4=not very important, 5=not at all important.

Race is apparently perceived to be less important in Hungary (40%). Religion appears as an important determinant of success again in Latvia (89%) and Estonia (88%)[5]. Estonia has also the highest percentage of respondents considering gender essential or very important to success in life (77%). As far as the questions regarding the reward principle are concerned Estonia again signals a high degree of perceived IOp with only the 46% of the respondents

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[4] This may be connected to the problem of access to the labour market for non-native speakers (mainly Russian) more than with the issue of race per se.

[5] Also in this case the religious cleavage overlaps with ethnicity with a minority of Russian-speaking Orthodox followers in both countries.

considering ambition at least very important, the highest percentage is found in Poland (91%). Finally, hard work is viewed as an essential element of success in Cyprus and Poland (88% and 85%) while, at the opposite end of the scale is Denmark with only the 41% of respondents convinced of its importance. Table 3 shows a large heterogeneity both in the absolute importance and the ranking of different sources of inequality. Religion is on average considered the main source of unequal opportunity, ambition and hard work are also perceived as important factors to succeed in life. Knowing the right people is on average perceived to be the least important of the variables considered.

Even though each answer may be considered a good proxy for the perception of IOp, the weak correlation of the answers distribution across dimensions suggests that we must include all those factors in an aggregated index in order to consistently compare IOp as it is measured and as it is perceived across countries[6]. As shown in Table 3 the channels of transmission of unfair inequality greatly differ from country to country.

Moreover, we are interested in a measure of IOp perception that is sensitive to violations of both the principle compensation and the principle of reward. Indeed, one can imagine a society in which hard work plays a clear role in determining individual success, that is also a society in which the extent of what one can attain is strongly influenced by socioeconomic background (the principle of reward is satisfied but the principle of compensation is not). Similarly, it could be that family wealth has no role in determining success in life but nevertheless the effort one exerts plays no role in determining your success in life, because, for example individual achievements are entirely determined by luck or other random factors (the principle of compensation is satisfied but the principle of reward is violated).

To explore the link between perception and measured IOp we aggregate the seven components in a scalar measure of IOp perception. As we are dealing with ordinal variables we propose a simple index which both aggregates the seven dimensions and preserves the ordinal nature of the answers. We first make the five questions about compensation consistent with the other two, that is we recode them so that 1="not at all important" and 5="essential". Individual perception is then determined as the median of the seven answers. In the resultant index of Inequality of Opportunity Perception, IOpP, ranges between one and five. IOpP

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[6] Table 7 in the Appendix reports correlations between the fraction of answers in Table 3 for each pair of components. The correlations have the expected signs but are on average rather weak.

assumes value one when at least four of the seven factors violating the principle of equal opportunity are judged as "not at all important" and it assumes value five when at least three of the seven violations are perceived as essential. In order to get a sense of how this would operate imagine to ask to someone to rank the sources of unfair inequality from the least important to the most important, pick the median (4th) and ask her how important is that particular source of inequality of opportunity from 1="not at all important" to 5="essential". The answer is her individual *IOpP* .

IOpP has some undesirable limitations: it arbitrarily assigns the same weight to each component and - being based on the median of a small sample - may be not the best measure of central tendency. On the other hand, *IOpP* has the important property of not imposing a cardinal meaning to an ordinal scale. This property will be exploited when assessing the determinants of the individual perception of inequality of opportunity, it is however not preserved when we calculate the average perception in each country.

4 Estimates

Figure 2 reports perceived and measured IOp in the 20 European countries. The top scatterplot presents both IOp and IOpP in absolute terms. The correlation is very weak and not statistically significant. Although, it should be noted that an increase in IOp is associated with a slightly increase in IOpP, many countries with a similar degree of equality of opportunity show very different perceptions of the phenomenon. Belgium and United Kingdom have very similar IOp values but are found at the two extremes in terms of perception. Similarly Bulgaria has four time the IOp of Switzerland but very similar average perception. However, it may be much easier for respondents to assess the relative position of their own countries in terms of IOp rather than the absolute intensity of the phenomenon the bottom scatterplot reports the same correlation looking at the rank of countries. Again average perception is very far from the actual ranking of countries based on the IOp measure. With some countries extremely far from what is expected (the 45 degree line). Such descriptive figures suggest that how individuals perceive IOp very weakly correlates with how scholars measure it. Note also that this conclusion is not driven by the way we have aggregated the seven answers. In the Appendix Figure 4 reports the scatterplots for the rankings of each one of the seven questions separately: all scatterplots show an even lower level of associ- ation between IOp and its perception. In the last case, the question about hard work, the correlation of ranks has the unexpected negative sign.

Figure 2: Inequality of opportunity: measure and perception
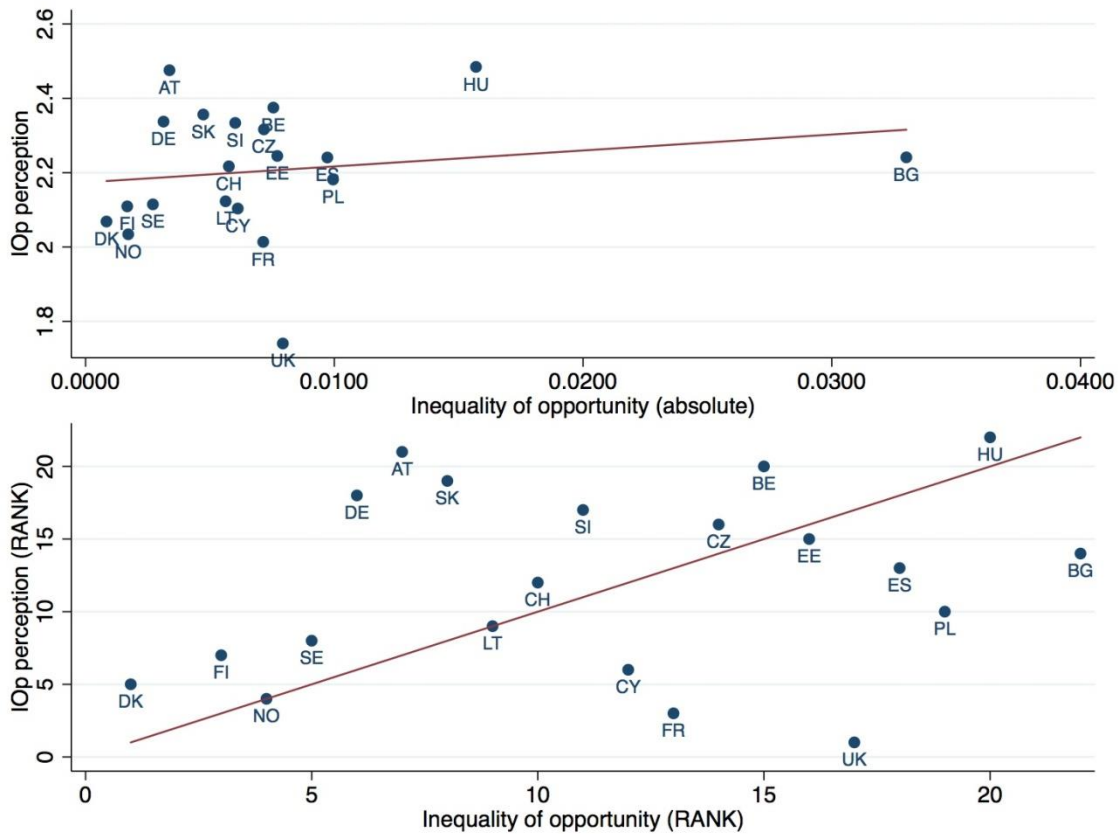
Source: ISSP (2009) & EU-SILC (2011). Inequality of opportunity is the share of total inequality due to exogenous variables (IOp in eq. 2). Attitude toward inequality is the average IOpP index in each country.

This descriptive figures show that individuals' perceptions do not amount to an unbiased average perception of IOp. We have suggested that *IOpP* may differ from *IOp* because in quantifying the role of circumstances on successes and failures individuals may tend to weight their own experience too heavily. If this is the case their evaluation of IOp may be distorted by a self-esteem bias. In what follows we specify a model able to identify a number of determinants of the individual IOp perception. Because we have aggregated the seven answers, preserving their ordinal nature, *IOpP* is a multichotomous dependent variable. For individual i in country j we assume that there is a latent continuous metric underlying the ordinal answer to the median of the seven questions ($y^*_{i,j}$). We assume also that the latent variable is a linear combination of a number of independent determinants at individual levels (x), a set of cutpoints (μ), and an unobserved individual effect ε assumed normally distributed across observations.

$$y^*_{i,j} = x'\beta + \varepsilon_{i,j} \tag{3}$$

Inequality of opportunity varies across countries, it is therefore safe to assume a component of the individual effect is shared by respondents from the same country. If this is the case $\varepsilon_{i,j}$ should be written as the sum of an individual and a country unobservable effect:

$$y^*_{i,j} = x'\beta + v_j + \varepsilon_{i,j} \tag{4}$$

v_j can be a fixed effect or can be influenced by a number of country level variables, in the latter case can be written as a function of a set of country level variables (z) and an unobserved country specific effect (u).

$$y^*_{i,j} = x'_{i,j}\beta + z_j'\gamma + u_j + \varepsilon_{i,j} \tag{5}$$

y^* is not observable, what we observe is:

$$y_{i,j} = \text{not at all important if } y^*_{i,j} < \mu_1$$

$$y_{i,j} = \text{not very important if } \mu_1 < y^*_{i,j} \leq \mu_2 \tag{6}$$

$$...$$

$$y_{i,j} = \text{essential if } y^*_{i,j} > \mu_4$$

If the mean and variance for ε are normalised to be zero and one and assumed independent of u_j we get:

$$\text{Prob}(y_{i,j} = \text{not at all important} \mid x, z) = H(\mu_1 - y_{i,j})$$

$$\text{Prob}(y_{i,j} = \text{not very important} \mid x, z) = H(\mu_2 - y_{i,j}) - H(\mu_1 - y_{i,j}) \tag{7}$$

$$…$$

$$\text{Prob}(y_{i,j} = \text{essential} \mid x, z) = 1 - H(\mu_4 - y_{i,j})$$

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Where $y_{i,j}$ can be specified according to equations (3), (4) or (5) and $H(.)$ is the logistic cumulative distribution function. These probabilities and the degree of association with some explanatory variables can be estimated by maximum likelihood with an ordered logit regression model (Green, 2003; Rabe-Hesketh & Skrondal, 2012). We specify three versions of the ordered logistic model. (3) A pooled model with corrections of the standard error to account for data clustered in 20 countries, (4) a pooled model with country fixed effects, (5) a mixed two level model. The latter is a two-level model in which individuals are nested in countries. For the first two models we include among regressors individual controls: the age of the respondent, her sex, her education (whether she at least completed upper secondary level education or not), her employment status (worker, unemployed, retired), if she is in education, and its area of residency (urban vs. rural). Moreover, in order to test for the presence of a self-esteem bias we add two dummy variables: downward mobility and upward mobility. The former takes value one if the respondent considers the job qualification she has today lower than the job qualification that her father had when she was between 14 and 16 years of age. The latter takes value one if the respondent considers her job qualification higher[7]. The mixed model includes also country level regressors. Because the inclusion of many cluster level controls has been shown to be problematic for similar numbers of clusters (Bryan & Jankins, 2015) we limit the number of country level controls to three: IOp in 2010, GDP per capita in PPP, and the GDP per capita growth in the 1999-2009 decade. Table 4 contains the coefficients for the three specifications of the model.

Estimates are consistent across specifications however, the likelihood-ratio test ($\chi^2 = 428.66$Prob $> \chi^2 = 0.0000$) suggests that there is enough variability between countries to prefer a multilevel ordered logistic model over a standard ordered logistic model. We therefore focus on the interpretation of model (5).

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[7] Note that we are assuming that individuals are able to assess their level of qualification relatively to their parents which is not necessarily always the case (Webb, 2000).

Table 4: Individual IOp percetpion: ordered logit estimates

	(3) pooled	(4) pooled (FE)	(5) mixed two level
number of observations	19,124	19,124	19,124
education	-0.0399	0.01732	0.0410
male	0.0391	0.0437	0.0465*
age	0.0041***	0.0057***	0.0056***
upward mover	-0.1351***	-0.1096***	-0.1169***
downward mover	0.0862	0.1242*	0.1117*
unemployed	0.2373**	0.2203**	0.212**
retired	-0.0488	-0.0553	-0.0749
in education	-0.2880***	-0.3254***	-0.3357***
worker	-0.0783	-0.0863	-0.1003
urban area	0.0709***	0.1023***	0.1048***
country effects	no	yes	yes
IOp			1.3393
GDP p.c.			-0.0003**
growth			-0.1684***
μ_1	-1.5333***	-0.9416***	-1.4672***
μ_2	0.8551***	1.492***	0.9651***
μ_3	3.1445***	3.808***	3.2804***
μ_4	5.1804***	5.8491***	5.3206***
random effects			95% conf. int.
var(intercept)			0.0963 [0.0790 0.1173]

95% confidence intervals in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: Author' calculation based on ISSP, 2009; EU-SILC, 2011, Eurostat, 2015.

We first assess whether the categories constructed aggregating the seven answer are distinguishable categories for the respondents looking at the cutpoints (μ_1, ..., μ_4) confidence intervals. Categories with overlapping confidence intervals in an ordinal model are interpreted as signaling that ordinal categories are undistinguishable and would suggest to col- lapse those categories. However, in our case the values of the perception variable seem to be perceived as well distinguished by individuals. Threshold parameters are significantly

different at a 95% level of confidence. Indeed, thresholds are equally spread out suggesting that the categories we have constructed do not differ much in scope.

The interpretation of the coefficients varies depending on the category considered. An increase in one of the regressor with a positive coefficient is equivalent to shifting the distribution to the right. This shift has an unambiguous consequence on the first and last categories (minimum and maximum perceived level of IOp) because it shifts some mass out of the first interval $[-\infty, \mu_1]$ and toward the last interval $[\mu_4, \infty]$. Therefore to be older or unemployed reduces the probability of having the lowest possible perception of IOp. By contrast students have a higher probability of choosing a combination of answers leading to the minimum IOpP. Urban residency, a variable often included as a proxy for reference group in models of relative deprivation, significantly increases the degree of inequality of opportunity perceived. The self-esteem hypothesis is confirmed for the lowest and highest category by the highly significant coefficients for the downward and upward mobility variables. As far as country variables are concerned GDP per capita and GDP growth increase the probability to have the lowest possible perception of IOp. Interestingly enough the objective measure of IOp seems to have no impact in the perception of IOp itself. However, these interpretations cannot be extended to the three middle categories because the shift of the distribution implies that some mass will move into each of the middle categories but some will also move out.

To evaluate the effect of our control across all the IOpP categories we report the marginal effects for all categories and all variables in Table 5.

As expected the marginal effects for the first category have the opposite sign of the coefficients. A positive coefficient indicates that an increase in the regressor reduces the probability of the lowest category, this implies a negative marginal effect for the probability to be in the first category (IOpP = 1). Age, unemployment status, urban residency, and having experienced downward mobility reduce the probability of having a low perception of IOp. Conversely, respondents who are in education and have experienced upward mobility are more likely to perceive a low level of IOp. Country level controls Marginal effects for the probability of being in the second category, where we find the majority of respondents, have all the same signs but are lower in terms of magnitude.

Table 5: Individual IOp percetpion: ordered logit marginal effects calculated for model (5)

	category 1	category 2	category 3	category 4	category 5
average probability	0.1547	0.5235	0.2768	0.0386	0.0062
education	-0.0054	-0.0035	0.0072	0.0015	0.0002
male	-0.0061	-0.0041	0.0082	0.0017	0.0002
age	-0.0007 ***	-0.0005***	0.0010 ***	0.0002 ***	0.0000***
upward mover	0.0153 ***	0.0102 ***	-0.0205 ***	-0.0043 ***	-0.0007 ***
downward mover	-0.0148 *	-0.0105 *	0.0197 *	0.0042 *	0.0007 *
unemployed	-0.0260 **	-0.0218 **	0.0379 **	0.0085 **	0.0014 **
retired	0.099	-0.0063	-0.0131	-0.0027	-0.0004
in education	0.0485 ***	0.0206 ***	-0.0564 ***	-0.0108 ***	-0.0018***
worker	0.00131*	0.0089	-0.0176	-0.0037	-0.0006
urban area	-0.0135***	-0.0095 ***	0.0176***	0.0039***	0.0007***
IOp	-0.1752	-0.1171	0.2348	0.049	0.0083
GDP p.c.	0.0004**	0.0.003**	-0.0006**	-0.0001**	-0.000**
growth	0.0221***	0.0147***	-0.0296***	-0.0061***	-0.0010 ***

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: Author' calculation based on ISSP, 2009; EU-SILC, 2011, Eurostat, 2015.

For example, being a downward mover instead of an upward mover reduces the probability of being in the first category by 3%, this difference is reduced to slightly more than 2% in the second category. All the statistical significant marginal effects have the opposite sign for the three highest categories. The country level controls show that, after controlling for all the other observable covariates, GDP per capita and GDP growth in the last decade affect IOpP: the perception of inequality of opportunity decreases in richer and more dynamic countries. However, as already shown in Table 4, the most interesting result is that the measure of IOp included among controls does have the expected effect on its perception (reduces the probability to be in the first categories) but this effect is not statistically significant.

Although we are reluctant to conclude that the way economists measure inequality of opportunity has nothing to do with the way it is perceived by people, this estimates suggest that the other country characteristics and individual variables play a much clearer role in determining IOp perception.

Finally, in Figure 3 we report for each category the 95% confidence interval for predicted odd ratios of the two type of respondents: upward movers and downward movers. Although the precision of the estimates is very different for the two groups (upward movers are about twice as many as downward movers) the distribution of the odd ratios across categories show that, other things held constant, the experience of intergenerational mobility significantly modifies the perception of IOp.

Figure 3: Perception of IOp for upward and downward movers
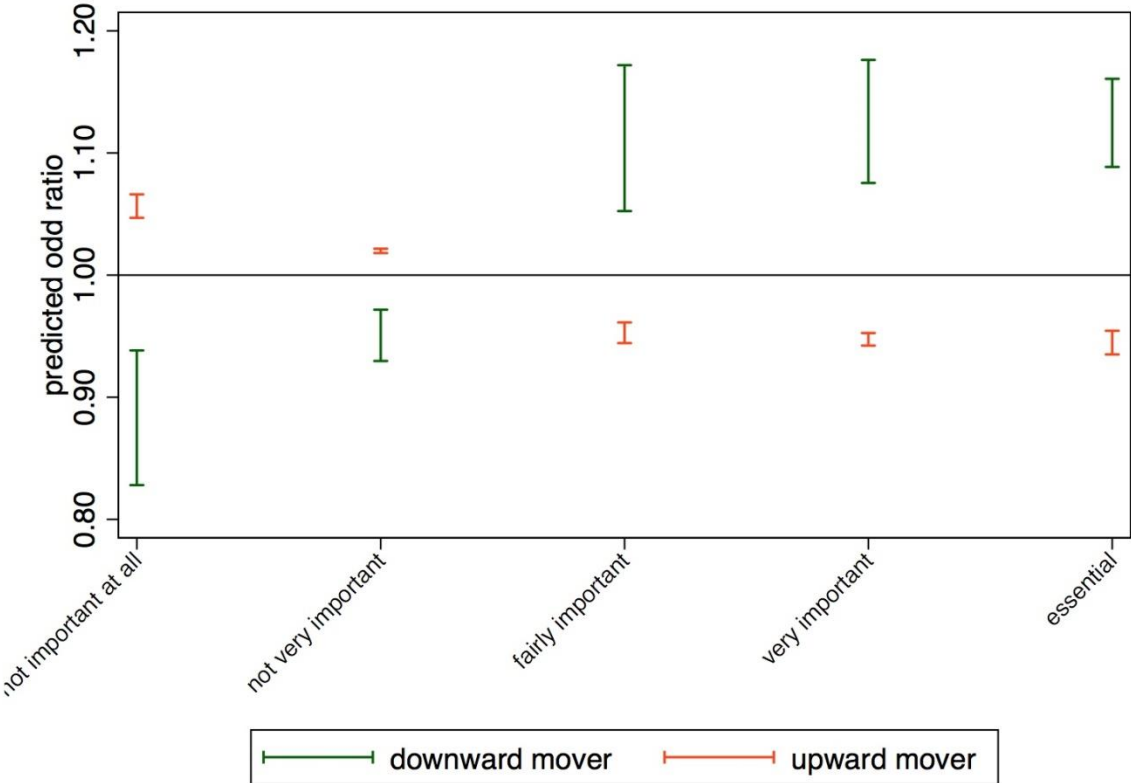
Source: ISSP(2009) and EU-SILC (2011). Intervals correspond to 95% confidence intervals.

IOpP is constructed aggregating information about seven questions but none of them explicitly refers to occupational mobility. Moreover, questions about personal experiences of social mobility are unlikely to have framed these answers because they are asked later in the questionnaire. Aware that the controls available are limited, leaving a large part of IOpP variability unexplained or explained by country fixed effect, we interpret our results as evidence of the role of individual experience in biasing IOp perception.

5. Conclusions

The perception of economic phenomena such as growth, inequality and discrimination can have a large impact on the believes and choices of individuals. Investment choices, electoral behaviour, reproductive decisions may be based on perceived phenomena rather then on objective measure of them. When the Arab Spring spread throughout the majority of the Arab countries in 2010 many commentators suggested that protests were triggered by increasing inequality. However, there exist no clear evidence of increasing income inequality in those countries in the preceding years. Nevertheless, perceived inequality have been growing and may be among the causes of one of the most important revolutionary wave of the last decades.

Political scientists, sociologists and economists are aware of the role of perceptions. Believes ad perceptions are often included among explanatory variables in the analysis of individual or collective behaviours. However, perceptions are often considered exogenous variables and the analysis of how they are formed is rarely the focus of these studies.

This paper is the first attempt to empirically explain the individuals perception of in- equality of economic opportunity. There are many possible definitions of equal opportunity ranging from definitions prescribing that outcomes should be allocated according to talent and merit, to fully egalitarian interpretations of the same principle. However, the vast majority of these definition distinguish between fair and unfair source of inequality and list among the latter circumstances beyond individual control such as: race, gender or socioeconomic background.

We adopted one of the most popular definition and we estimated a widely used measure of inequality of opportunity in a sample of 20 European countries. For the same countries we construct an individual ordinal measure of perceived unequal opportunities and merging the two measures we show a weak correlation between prevailing perceived inequality of opportunity and objective measures of the same phenomenon. A weak correlation is found both looking at the absolute perception and at the ranking of countries. Among possible models to explain the individual perception of the phenomenon we opted for a a mixed ordinal logit model. Together with a country random effect, two of the three country level explanatory variables included, GDP per capita and economic growth, are shown to explain a significant share of the total perception variability. In richer and more dynamic countries the perceived inequality of opportunity is lower. Conversely our model suggests that, after

controlling for all the other variables, the estimated inequality of opportunity does not play a significant role in determining its perception. Further, we found a number of individual characteristics to have an impact on the degree of perceived inequality of opportunity. Among them, unemployment and experiencing downward intergenerational mobility significantly increase the probability of a person perceiving a lower degree of equal opportunity in her country. We interpret these relationships as signals of the existence of a self-esteem bias in the cognitive process of how people view equality of opportunity: respondents that have good reasons to perceive their experience in the labour market as a failure systematically overemphasise the role of external causes in determining socioeconomic success.

Our results suggest that the popular perception of inequality of opportunity may be very weakly linked to objective measures of the same phenomenon produced by scholars. Conversely, other country characteristics - such as wealth and growth - together with individual experiences play a determining role in shaping our perception of complex phenomena such as inequality of opportunity. These findings suggest an interesting direction for future research; is it possible to construct an index of relative IOp obtained by aggregating individual perceptions? Can Yitzhak's approach to relative deprivation be transferred to inequality of opportunity?

References

Adler M., and Fleurbaey M. 2015. Oxford Handbook on Well-being and Public Policy. Oxford University Press.

Alesina, A., and E. La Ferrara. 2005. 'Preferences for Redistribution in the Land of Opportunities'. Journal of Public Economics vol. 89 (5-6): 897-931.

Alesina A., G. M. Angeletos. 2005. 'Fairness and Redistribution'. American Economic Review vol. 95 (4): 960-980.

Atkinson T., and Bourguignon F. 2015. Handbook of Income Distribution Volume 2. Elsevier.

Attias-Donfut C.,W.Francois-Charles .2001.'La dimension subjective de la mobilité sociale'. Population. vol. 56 (6): 919-958.

Brunori, P., F.H.G. Ferreira, V. Peragine. 2013. 'Inequality of opportunity, income inequality and mobility: some international comparisons', in Getting Development Right: Structural Transformation, Inclusion and Sustainability in the Post-Crisis Era edited by E. Paus. Palgrave Macmillan.

Brunori P. and Peragine V. 2011. 'Compensation, reward, and the measurement of unfair inequalities', in Research on Economic Inequality, vol. 19, Inequality of opportunity. Emerald. edited by Juan Gabriel Rodríguez. Emerald Group Publishing Limited.

Bryan M., and S. Jenkins. 2015. 'Multilevel Modelling of Country Effects: A Cautionary Tale', European Sociological Review, published on line March 2015.

Chambers, J., L. Swan, and M .Heesacker. 2014. 'Better Off Than We Know: Distorted Perceptions of Incomes and Income Inequality in America'. Psychological Science vol. 25 (2): 613618.

Cherkaoui M. 1995. 'Mobilité sociale et comportement électoral : taxinomie des modèles de relations'. Revue Francaise de sociologie vol. 36, (36-1): 171-183.

Checchi, D., and V. Peragine. 2010. 'Inequality of Opportunity in Italy'. Journal of Economic Inequality vol. 8 (4): 429-450.

Checchi D., V. Peragine V., L. Serlenga. 2015. 'Income Inequality and Opportunity Inequality in Europe: Recent Trends and Explaining Factors'. Paper presented at the 6th ECINEQ meeting University of Luxembourg, July 2015.

Corak, M. 2013. 'Income Inequality, Equality of Opportunity, and Intergenerational Mobility'. Journal of Economic Perspectives vol. 27(3): 79-102.

Cruces, G.,R. Perez-Truglia, M. Tetaz. 2013. 'Biased perceptions of income distribution and preferences for redistribution: Evidence from a survey experiment'. Journal of Public Economics vol. 98: 100-112.

Eurostat. 2015. GDP per capita in PPS available at: http://ec.europa.eu, access May, 19.

Fleurbaey, M.1995.'Three solutions for the compensation problem'. Journal of Economic Theory vol. 65: 505521.

Fleurbaey, M. 2008. Fairness, responsibility and welfare. Oxford University Press.

Fleurbaey M., and F. Maniquet. 2011. A Theory of Fairness and Social Welfare. Cambridge University Press.

Fleurbaey, M., and V. Peragine. 2013. 'Ex ante versus ex post equality of opportunity'. Economica vol. 80: 118-130 .

Fleurbaey, M., and E. Schokkaert. 2009. 'Unfair inequalities in health and health care'. Journal of Health Economics vol. 28: 7390.

Ferreira F., and V. Peragine. 2015. 'Equality of Opportunity: Theory and Evidence'. in Oxford Handbook of Well-Being and Public Policy edited by M. Adler and M. Fleurbaey. Oxford University Press.

Gimpelson V., and G. Monusova. 2014. 'Perception of Inequality an Social Mobility'. Basic Research Program Working Paper 84/EC/2014, National Research University Higher School of Economics.

Gimpelson, V., and D. Treisman. 2015. 'Misperceiving Inequality'. NBER Working Paper No. 21174, May 2015.

Greene, W.. 2003. Econometric Analysis. Fifth edition, Prentice Hall.

Hirschman, A. O., and M. Rothschild. 1973. 'The Changing Tolerance for Income Inequality in the Course of Economic Development'. The Quarterly Journal of Economics vol. 87 (4): 544-66.

Keller T., M. Medgyes, I. Tòth. 2010. 'Analysing the link between measured and perceived income inequality in European countries'. Research note no. 8. European Commission Directorate-General Employment, Social Affairs and Equal Opportunities.

Lu X. 2012. 'Equality of Educational Opportunity and Attitudes toward Income Inequality: Evidence from China'.Texas University, mimeo.

Marrero, G., and J. Rodrguez. 2012. 'Inequality of Opportunity in Europe'. Review of Income and Wealth vol. 58: 597-621.

Niehues J. 2014. 'Subjective Perceptions of Inequality and Redistributive Preferences: An International Comparison'. Quarterly journal of empirical economic research vol. 2. Cologne Institute of Economic Research.

Norton, M. I., and D. Ariely. 2011. 'Building a better America-one wealth quintile at a time'. Perspectives on Psychological Science vol. 6: 912.

Miller,D.T.,andM.Ross.1975.'Self-Serving Biases in the Attribution of Causality: Fact or Fiction?'. Psychological Bulletin vol 82 (2): 213-225.

Pasquier-Doumer,L. 2005 'Perception de l'inégalité des chances et mobilité objective et subjective : une analyse à partir d'en tretiens qualitatifs auprès de Liméniens'. DIAL Document de Travail 2005/17.

Piketty, T. 1995. 'Social Mobility and Redistributive Politics'. The Quarterly Journal of Economics. vol. 60 (3): 551-584.

Rabe-Hesketh, S., and A. Skrondal. 2012. Multilevel and Longitudinal Modeling Using Stata. 3rd ed. College Station, TX: Stata Press.

Ramos, X. and D. van de Gaer. 2012. 'Empirical Approaches to Inequality of Opportunity: Principles, Measures, and Evidence', Discussion Paper No. 6672, Institute for the Study of Labor (IZA), Bonn.

Roemer, J. 1998. Equality of Opportunity. Harvard University Press.

Roemer J., and A Trannoy. 2015. 'Equality of Opportunity'. In Handbook of In- come Distribution Edited by Anthony B. Atkinson and Francois Bourguignon. vol. 2. Elsevier.

Runciman, W. G. 1966. 'Relative Deprivation and Social Justice'. Reports of the Institute of Community Studies. Routledge and Kegan Paul.

Russell, D. 1982. 'The causal dimension scale: A measure of how individuals perceive causes'. Journal of Personality and Social Psychology vol. 42: 1137-1145

Van de gaer, D. 1993. Equality of opportunity and investment in human capital. Ph.D. Dissertation, Katholieke Universiteit Leuven.

Verme P. 2013. 'Facts and Perceptions of Inequality', in Inside Inequality in the Arab Republic of Egypt'. Edited by Paolo Verme, Branko Milanovic, Sherine Al- Shawarby, Sahar El Tawila, May Gadallah, and Enas Ali A.El-Majeed. The World Bank.

Silber J., and P. Verme. 2012. 'Relative deprivation, reference groups and the assess- ment of standard of living'. Economic Systems vol. 36 (1): 31-45

Yitzhaki, S. 1979. 'Relative Deprivation and the Gini Coefficient'. Quarterly Journal of Economics vol. 93: 321-324.

Webb, R. 2000. 'Pilot Survey on Household Perception of Mobility: Peru 1998', in New markets new opportunities? Economic and social mobility in a changing World. Brooking Institute Press.

Weiner, B. 1974. Achievement motivation and attribution theory. Morristown. General Learning Press.

Whyte M. 2010 Myth of the Social Volcano: Perceptions of Inequality and Distributive Injustice in Contemporary China. Stanford University Press.

Appendix

The measure of inequality of opportunity is obtained partitioning the population into 16 types based on three circumstances: sex, parental education, and parental occupation. Parental occupation is coded into two groups: higher when at least one parent completed upper secondary, and lower otherwise. Parental occupation status is based on the highest ISCO 88 occupation status of the parents, grouped into three categories: highly skilled non-manual (ISCO codes 11-34), lower-skilled non-manual (41-52), skilled manual (61-83) and elementary occupation (91-93).

Table 6: EU-SILC descriptive statistics

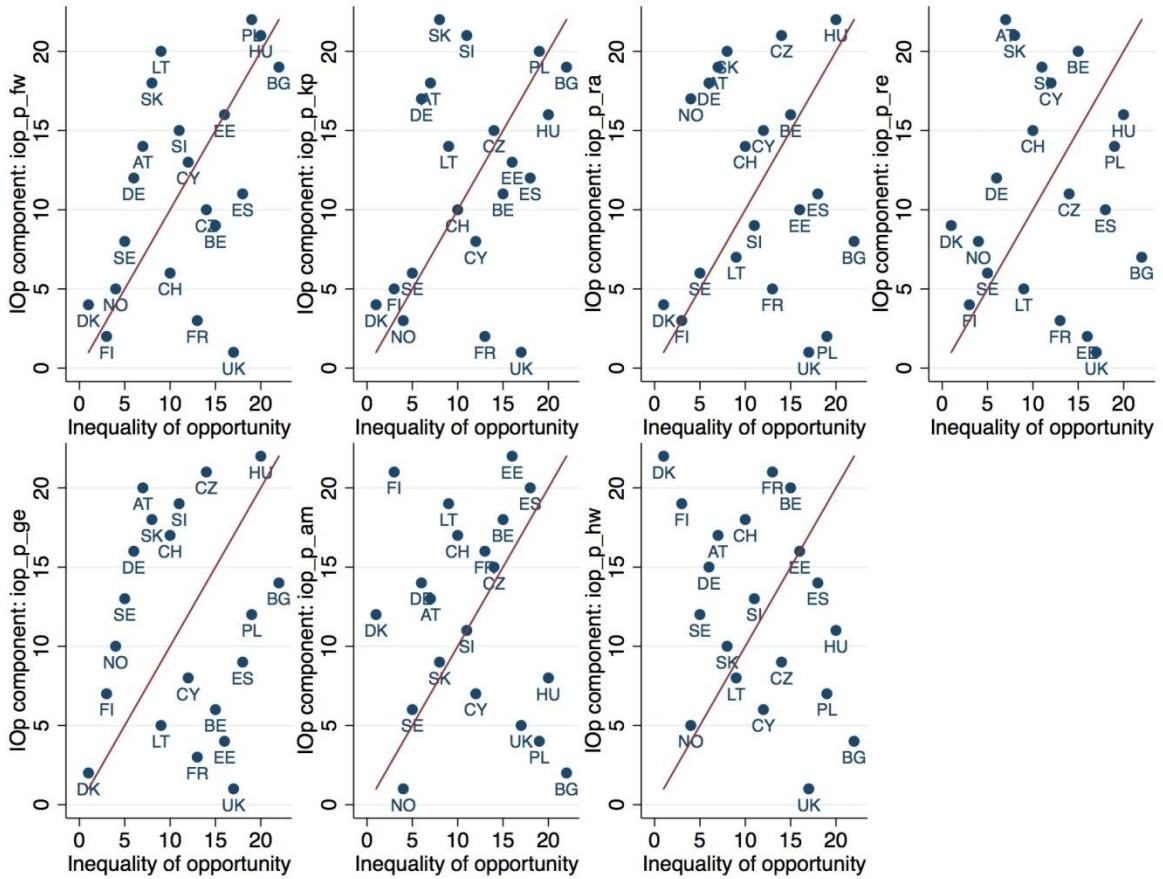| country	female	parental education		parental occupation			
		low	high	elementary occupation	skilled manual	lower-skilled non-manual	highly skilled non-manual
BE	0.5006	0.4815	0.5185	0.0128	0.1149	0.1498	0.7225
BG	0.4965	0.4555	0.5445	0.1148	0.3273	0.2435	0.3144
CH	0.5024	0.2799	0.7201	0.0161	0.1262	0.2239	0.6338
CY	0.5213	0.6368	0.3632	0.0378	0.2171	0.1586	0.5866
CZ	0.5632	0.5576	0.4424	0.0278	0.2646	0.3887	0.3189
DE	0.4966	0.1367	0.8633	0.0232	0.1177	0.2582	0.6009
DK	0.5031	0.0858	0.9142	0.0000	0.0924	0.2849	0.6228
EE	0.5269	0.2494	0.7506	0.0241	0.2374	0.2447	0.4937
ES	0.4947	0.8039	0.1961	0.0193	0.0736	0.0914	0.8156
FI	0.4785	0.4420	0.5580	0.1463	0.1553	0.1941	0.5044
FR	0.5148	0.7388	0.2612	0.0507	0.1074	0.2405	0.6014
HU	0.5076	0.5695	0.4305	0.0560	0.2773	0.2791	0.3877
IS	0.5014	0.2753	0.7247	0.0099	0.1508	0.2820	0.5574
LT	0.5248	0.4647	0.5353	0.1562	0.2753	0.1899	0.3786
NO	0.4769	0.2326	0.7674	0.0083	0.1067	0.3674	0.5176
PL	0.5070	0.3961	0.6039	0.0254	0.3665	0.2110	0.3970
PT	0.5047	0.9013	0.0987	0.0310	0.2739	0.1391	0.5560
SE	0.4709	0.4298	0.5702	0.0080	0.0727	0.2309	0.6883
SI	0.4975	0.6402	0.3598	0.0613	0.1836	0.2777	0.4773
SK	0.5108	0.3156	0.6844	0.0858	0.2281	0.3554	0.3307
UK	0.5303	0.5346	0.4654	0.0177	0.1103	0.2403	0.6317

Source: Author' calculation based on EU-SILC (2011)

Table 7: Answers correlation across IOpP components

	family wealth	connections	race	religion	gender	ambition	hard work
family welath	1						
connections	0.6560	1					
race	0.0832	0.0970	1				
religion	0.2855	0.2803	0.4373	1			
gender	0.4183	0.5368	0.6075	0.5583	1		
ambition	-0.3234	-0.2030	-0.3474	-0.5543	-0.5288	1	
hard work	-0.4338	-0.3156	-0.0308	-0.1495	-0.1847	0.6295	1

Source: Author' calculation based on ISSP, 2009.

Figure 4: Inequality of opportunity components: measure and perception (ranks)