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Valle-Inclán Cruces, Hugo del

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**PHD THESIS SUMMARY:
Issues on the Measurement of Opportunity Inequality**

HUGO DEL VALLE-INCLÁN CRUCES
PhD in Economics, February 2021
University of Vigo

Recent years have seen a surge in the literature on *inequality of opportunity* (henceforth, IOp). This is possibly due to its compelling notion of fairness, which resonates in economic, political, and journalistic circles (Bourguignon, Ferreira, and Walton 2007; Manuelyan Atinc et al. 2005). However, the empirical application of IOp is inconsistent and must improve in order to become policy-relevant. The shortcomings of IOp measurement include a lack of correspondence with its theoretical principles, stringent data limitations, and the absence of a standardized, widely accepted methodology. In my dissertation, I have explored these issues.

In this summary, I will first briefly introduce the notion of IOp, then review the contributions of my doctoral thesis. This notion traces back to a debate in political philosophy during the 1970s and 1980s, which shifted the focus of the egalitarian project from ‘equality of outcomes’ to ‘equality of chances’. Building on the work of John Rawls (1971), philosophers such as Richard Arneson (1989), Gerald Cohen (1989), Ronald Dworkin (1981a, 1981b), and Amartya Sen (1980) sought to define a concept of equity that would align individual rewards with personal responsibility. Where political philosophers started, economists soon followed. The seminal contributions of Marc Fleurbaey (1995), John Roemer (1993, 1998), and Dirk Van de gaer (1993) modelled this ideal of fairness and combined it with distributional analysis, systematically analysing which allocations should be deemed ‘fair’ or ‘unfair’.

In short, inequalities in any outcome—be it income, wealth, health status, and so on—are ‘fair’ or ‘unfair’ depending on what they stem from. Inequality caused by factors under an individual’s control—like the degree of effort exerted—is considered fair, while unfair inequality arises from circumstances beyond individuals’ control—like gender or race.

Hence, the goal of the egalitarian project is to create a ‘level-playing field’, which eradicates unfair but preserves fair sources of inequality.¹

My thesis is structured in six chapters. I begin by introducing the philosophical and empirical basis of IOp in chapters 1 and 2, respectively. Chapters 3 and 4 attempt to tackle the abovementioned shortcomings of IOp measurement. Chapter 3 looks at an inconsistency of IOp measurement with respect to its theoretical principles—in particular, that the level of analysis may entail a normative choice regarding gender; and chapter 4 addresses the problem of data limitations in the IOp approach. In chapter 5, building on the contributions of the previous two chapters, I show how to measure IOp in Europe with an unprecedented level of detail. Chapter 6 concludes. In the rest of this summary, I will go over chapters 3, 4, and 5 in more detail.

Chapter 3 tackles an inconsistency of IOp measurement with respect to its theoretical principles. In particular, I scrutinise the appropriate level of analysis, and argue that, when measuring IOp, the level of analysis may entail a normative choice regarding gender. Standard analysis of economic inequality looks at the distribution of income or wealth at the household level. This perspective is justified by the object of study—that is, the access to economic resources that individuals have (Jenkins and Van Kerm 2009)—which may be better captured by taking the household, rather than the individual, as the unit of analysis.² However, the IOp approach is not utilitarian, and the object of study is not the access of individuals to economic resources. Hence, such justification offers no hint to what the appropriate level of analysis should be. As a matter of fact, it is common to see empirical applications of IOp using either the household or the individual level as if they were interchangeable, but this issue carries major effects. The choice entails normative implications and strongly influences IOp estimates.

This chapter begins by showing that IOp estimates are strongly sensitive to the level of analysis. For this I employ one measurement technique (Ferreira and Gignoux 2011) with different outcomes of interest (some at the household level and other focused on individuals). With data from 31

¹ For a survey on the philosophical grounds of the IOp approach, see Ferreira and Peragine (2016), or Roemer and Trannoy (2016).

² As long as we assume (perfect) within-household redistribution, even though this rarely holds. Problems associated with this assumption are well known: see Haddad and Kanbur (1990) for an early reference. Recent contributions include Lechene, Pendakur, and Wolf (2019), who show that poor people may live in non-poor households, Fremeaux and Leturcq (2020), who find stark differences between household and personal wealth inequality, and Sauer, Rehm, and Mader (2021), who offer a general perspective.

European countries—employing the well-known and researched European Union Statistics on Income and Living Conditions (EU-SILC) database—I show that IOp estimates at the household and individual level are, in fact, uncorrelated, and that the latter tend to be much higher than the former. Then, I present a set of theoretical remarks detailing the causes for this discrepancy, which in great part is due to the role of gender in determining IOp. Namely, considering an outcome at the household level implies assuming within-household redistribution of opportunities, which virtually nullifies the importance of the circumstance gender, since most sampled households are composed of both men and women. Notice that pooling all resources of the household, that is, assuming within-household redistribution, means imputing the same amount of outcome to men and women who live together, blurring possible personal differences. Therefore, to be able to capture the effect of gender on IOp the focus ought to be on individuals—if one were to focus on households, the contribution of gender to the overall level of IOp would be obscured, biasing the estimates downwards. Finally, I check this claim empirically with a decomposition technique of overall IOp that confirms gender as a major component when the level of analysis is individuals, and barely relevant when it is households. I conclude by arguing that if one believes gender to be a potential source of IOp, then the appropriate level of analysis should be the individual.

Chapter 4 addresses the problem of data limitations in the IOp approach. In it, I propose a new measurement strategy that relaxes a ubiquitous data constrain, by circumventing the restriction imposed by the scarcity of a key piece of information: the family background of individuals. Family background is widely believed to play a major role in the determination of IOp, and hence, it is normally accounted for when measuring it. The standard proxies for this dimension of IOp are parental education and/or parental occupation, and, although these are naturally imperfect proxies, it is generally assumed that they serve the purpose well. In this chapter, I do not question their accuracy; rather, I deal with their availability.³ Since data on parental education and parental occupation is scarce, I propose using an alternative proxy, capital income, that is both related to family background *and* widely available.

³ Indeed, this kind of information is scarce: consider the following two well-known databases for the study of poverty and inequality. As of September 2021, the Luxembourg Income Study had information on parental education—parental occupation not available—in 92 of its 497 datasets (around 19%). Likewise, the EU-SILC database had information on parental education and occupation in 3 of its 16 waves (also around 19%).

Using capital income as a proxy for socioeconomic status has a practical advantage—it allows obtaining many new IOp estimates that would otherwise be impossible to obtain. But is it fit for purpose? The relationship between capital income and family background has been explored in a large body of literature studying wealth inequality, the intergenerational transmission of advantages, and the determinants of financial returns.⁴ In sum, the measurement strategy I propose works by leveraging the intergenerational persistence of wealth.

Given these theoretical foundations, I then proceed to the empirical validation. For this I also use data from the EU-SILC database, testing the accuracy of the method in 31 European countries with satisfactory results. The validation method consists of comparing standard estimates (obtained with a well-established methodology in the field, that is, using parental education and occupation to account for family background) with the ones obtained with the measurement strategy I propose. To the extent the latter are similar to the former, I conclude that the strategy is reliable. The differences reside, naturally, in the number of estimates I can obtain, not in their magnitude. Notice that I can only compare a few of the data points produced with my method, since they are many more than the ones generated with a standard methodology—the assumption is that if those data points that can be compared perform reliably, the rest will do so as well. In sum, I obtain very high correlations between the two sets of estimates. The correlations are close to one, both rank and pairwise, and the magnitudes are very close as well.

The fifth, and final, chapter demonstrates the benefits of the new measurement strategy by estimating and tracing the evolution of IOp in Europe during and after the Great Recession (2004–2017). The core contribution of these new IOp estimates is their unprecedented level of detail, which is only possible due to the use of capital income as an alternative proxy for family background. The main takeaway from these data is that, contrary to what might have been expected, IOp did not increase in most European countries during the Great Recession. Furthermore, no clear pattern arises across the continent; some countries saw their IOp increase while others saw it decrease. Even more puzzling, no relationship appears to exist between the extent to which an economy contracted during the Recession and the evolution of IOp its inhabitants endured.

⁴ In the thesis, I devote a whole section to a review of this literature. Prominent references include Alvaredo, Garbinti, and Piketty (2017), Charles and Hurst (2003), and Von Gaudecker (2015).

A second contribution of this chapter is a sensitivity analysis. More precisely, I use the EU-SILC panel data to assess the sensitivity of my IOP estimates to short-term income shocks. It is well-known that inequality estimates based on cross-sectional survey data might be distorted by transitory shocks to the income that individuals report. To assess the extent to which my estimates suffer from this problem I proceed to estimate IOP following the same individuals across four consecutive years. I find no support that my IOP estimates, obtained using the EU-SILC panel data, are sensitive to short-term income shocks. What is important to stress here is the following: since the EU-SILC panel data does not contain information on parental education, carrying out this robustness test is only possible thanks to using capital income as a proxy for family background. Without such an alternative proxy for family background, it would not have been possible to check, using the EU-SILC database, whether short-term income shocks may affect IOP estimates.

The IOP approach is very promising for the advancement of the egalitarian agenda. Still, it faces many methodological problems that prevent it from becoming policy-relevant. My thesis is an attempt to tackle two of these issues, one theoretical and the other empirical. First, I argue that in order to account for the effect of gender, estimates of IOP must take the individual, rather than the household, as their unit of analysis. Second, developing informed policies that target morally relevant inequality is severely limited by the lack of information on individuals. My thesis relaxes this limitation with respect to family background, an important determinant of IOP, by proposing—and motivating, both theoretically and empirically—capital income as an appropriate proxy for this dimension.

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Hugo del Valle-Inclán Cruces obtained his PhD from the University of Vigo, where he worked as researcher and teacher. He is a member of ECO-BAS. His dissertation is available in del Valle-Inclán Cruces (2021).
Contact e-mail: <hvalle-inclan@uvigo.gal>