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Multidimensional Perspectives on Inequality: Conceptual and Empirical Challenges

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Abstract

This report summarises some of the most relevant theoretical and empirical challenges associated with the measurement and analysis of multidimensional inequalities. Each section delves into a specific topic, presents a state-of-the-art review of the key findings in that particular area, and proposes a number of policy recommendations and avenues for further research. The themes covered in this report range from the multidimensional nature of human wellbeing and quality of life, the multiplicity of life domains in which substantial inequalities can be found, the dynamic nature of those inequalities, the transmission of advantages and disadvantages over time, the availability of new data sources for fine-grained data collection and higher spatial resolution policy-making, the interplay of individual effort and external circumstances when it comes to identifying a just distribution of opportunities in society, as well as the relevance of lifetime approaches for the study of economic inequalities within countries. The content of this work will provide help and guidance to policy-makers willing to understand and tackle inequalities from a broader multidimensional perspective, beyond the narrow limits of economic indicators alone.

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The content of this work has benefited from fruitful discussions with the participants to the workshops and seminars on « Multidimensional Perspectives on Inequality: Conceptual and Empirical Challenges », celebrated at the premises of the JRC in Ispra, between November 2019 and January 2020. Valentina Montalto and Frank Neher kindly agreed to moderate some of the sessions and round table discussions during those meetings. Together with Eleni Papadimitriou and Francesco Panella, they also contributed generously to the proofreading and editing of this report. Special thanks to Enkelejda Havari for her decisive contribution in shaping and guiding the discussion on inter-generational mobility.

Authors

Paul Anand, Enrica Chiappero-Martinetti, Giacomo Corneo, Abigail McKnight, Esteban Moro, Dave O'Brien, Vito Peragine, Jan Stuhler and Marcos Domínguez-Torreiro.

Executive summary

The JRC is currently undertaking a pilot research project on monitoring multidimensional inequalities in the EU (EU MIMF). This report constitutes the first deliverable of the EU MIMF project. It provides a state-of-the-art review of the latest developments in the study of inequalities by assembling together a number of contributions from key experts in the field. All the experts contributing to this report have participated in a series of workshops and seminars that took place at the premises of the JRC in Ispra from November 2019 to January 2020.

Inequalities pose a major threat to social cohesion and progress, and span multiple life domains such as health, education, material wellbeing, working life, social and family life, recreation and culture, and environmental conditions. This report provides a comprehensive overview of the main challenges related to the study of inequalities in life outcomes, inequality of opportunities and the intergenerational transmission of advantages and disadvantages. By contributing to a better understanding of inequalities and the factors underpinning them, it will also contribute to a better design and implementation of inequality related policies.

In the first chapter, Paul Anand introduces the Capability Approach and the notion of capabilities: what people are able to do or be in different life dimensions and domains. He also examines some of the ways in which capabilities can be measured at different stages of the life-course and how this information can help design (and monitor) policies viewing human quality of life as a multidimensional concept.

In the second chapter, Enrica Chiappero-Martinetti provides additional insights on the Capability Approach as a comprehensive theoretical framework that might be used for conceptualizing, contextualizing and understanding multidimensional inequalities. Accordingly, the chapter examines the main conceptual building blocks of the approach, and underscores the advantages of its multidimensional nature and scope.

Giacomo Corneo introduces the topic of measuring inequality from a lifetime perspective. More precisely, he illustrates the potential of data on lifetime incomes to assess inequality of material wellbeing, and provides insights on the role that the tax-transfer-system and differential mortality play in shaping lifetime disparities.

In chapter 4, Abigail McKnight discusses one of the first attempts to set up a tool for monitoring multidimensional inequalities grounded on the capability approach. The chapter presents the structure of the proposed monitoring tool, provides examples of the different dimensions and sub-dimensions included therein, and reviews the efforts and challenges to identify key inequality drivers and associated policy options.

Esteban Moro introduces the topic of how to use “big data” to inform inequality related policies. He examines the potential of “alternative” data sources—such as mobile phones and credit cards—to analyse behavioural patterns associated to inequalities and segregation, in a timely fashion and at a very high resolution level, such as neighbourhood areas.

Dave O'Brien's contribution focuses on the cultural dimension of inequality. He provides insights on the relationship between culture and inequality, both from a cultural production and cultural consumption perspective, and reflects on the gaps and limitations in our current knowledge of cultural inequalities at the European level.

Vito Peragine delves into the measurement of inequality of opportunity. He introduces the theory behind the metrics used to quantify inequality of opportunities—which are based on the distinction between individual choices and predetermined circumstances beyond individual responsibility—and showcases some recent empirical findings in the field.

In chapter 8, Jan Stuhler reviews some of the latest theoretical and empirical developments in the analysis of intergenerational transmission of advantages and disadvantages. He discusses at length the possibilities offered by the combination of novel research approaches and the increased availability of rich administrative data sources.

Finally, chapter 9 summarises the key findings and policy messages.

1 The Measurement of capabilities for the assessment of multi-dimensional inequalities (by Paul Anand¹)

1.1 Introduction - Capability assessment for public policy

Since the 1970s and 80s, there has been growing interest in the development of indicators in policy and research that directly assess human wellbeing and thereby enrich the information on quality of life provided by traditional income based measures. One of the first major institutional initiatives was that developed by the United Nations with the launch in 1990 of its Human Development Index which proposed to monitor quality of life around the world in terms of income, health and education, Anand and Sen (1994). Subsequently it has been argued that countries would benefit from an extension of the approach to cover more dimensions, e.g. Martinetti (2000) Atkinson et al (2002), Fukuda-Parr (2003), Robeyns (2006) Anand et al (2006) and Alkire et al (2007), Basu and Lopez-Calva (2011), Burchardt and Vizard (2011), Ferreira and Lugo (2013) and indeed such approaches have emerged.

A start was made by the EU which in 2003 began collecting data from member states on income and living standards, thus providing a more explicit picture of material living standards than can be derived from income data alone and one that was able to reflect growing interest in the extent to which growth was inclusive, Bossert et al (2007). The survey is repeated frequently and has additional modules that focus on different aspects of life quality as time goes on. Subsequently, national and international initiatives have engaged with the view that quality of life is a broad concept and includes some aspects that might only have a loose connection to financial status. In 2010, Bhutan carried out a national survey focussing which has been used to create a suite of 33 indicators of wellbeing relating to nine domains and in the following year, the OECD produced its Better Life Compendium, OECD (2011) which provided the basis of an interactive website that allows individual to produce country rankings based on their own relative weightings of dimensions. At around the same time, the UK's prime minister commissioned the National Office of Statistics to undergo a similar exercise and following consultation with the public as well experts it launched a quality of life wheel drawing on over 40 indicators in ten domain groupings.

While the wording of domains and indicators varies between these exercises, which has an impact on the scope for direct statistical comparisons, there is now an international recognition that human quality of life can be viewed as a multi-dimensional concept. Furthermore, and despite the differences in how these dimensions are framed, it is possible to identify significant commonality between approaches which suggests an interest in the dimensions of Table 1.

Table 1. Domains and Sub-dimensions of Quality of Life

Headline Categories - Domains of Interest	Subcategories – Dimensions Assessed
1 Health	Physical health, mental health, disability and assistance, nutritional quality, physical exercise
2 Education	Educational achievements, schooling experience, and school quality
3 Material	Material deprivation, income and assets
4 Paid work	Jobs, employment, internships
5 Safety	Safety, protection and quality of physical environment
6 Services	Access to adequate household and professional services
7 Family	Family life, parenting, care, leisure and spirituality
8 Social	Social and political participation, community quality and migration

¹ Economics Department, The Open University; Social Policy and Intervention, Oxford University; CPNSS, London School of Economics.

9 Inequality	Inequalities, rights, social entitlements, inclusion of disabled
10 Overall	Life satisfaction and agency

Source: Author's elaboration.

The first eight groupings are domain focussed while the last pair can be viewed as cross-cutting or summarising the impacts of what is going on in each domain. Agency, referring to decision-making ability has been much researched in the context of gender and quality of life, and is taken to be both inherently and instrumentally significant. How satisfied a person is with their own life has also been argued to be a valuable summary measure of life quality because it leaves it open to individuals themselves to determine what constitutes quality of life and how different dimensions should be weighted. Both agency and subjective wellbeing can be used to make an overall assessment though they might not always be correlated. A person able to make decisions for himself, but nonetheless facing a situation of decision-overload, could be stressed and therefore report a low level of subjective wellbeing. Often agency (in the sense of decision-making power, Kabeer (1999)) is an *input* into achieving personal goals whereas the experience of subjective wellbeing is an *outcome* reflecting not just their actions, but also their circumstances and their own personality. It is worth noting that there may be some conceptual overlap between the concepts of agency and voice, in practice the former term is often used to refer to inequalities of decision-making within households while voice can refer to the abilities of groups and or communities to influence decision-making in social and political contexts.

Inequalities have been included in this because sometimes international organisations have a separate category for this and in others they do not. The OECD's Better Life Index for example has 11 headline categories and inequalities are reflected within those. On the other hand, a number of the UN's 17 sustainable development goals are related to inequality and deprivation, while goal 5 is also specifically focused on gender inequalities. Within a system focussed on multi-dimensional approach inequality, there may be no need for a separate category.

The history of international and national initiatives provides a useful background is part of a general movement on the part of international organisations to supplement income measures of consumption abilities with information on quality of life more broadly. The UN and OECD in particular have been significantly influenced by the capability approach to quality of life developed and promoted by Sen (1999) and others. This approach offers a general account of what quality is, how it is produced and distributed that enables researchers and policy makers to make principled choices when designing dashboards for monitoring wellbeing in a multi-dimensional context. In the main section, 3, of this paper, we shall examine some of the ways in which capabilities are measured directly but before this we offer a short summary of some of the key theoretical and methodological issues that are relevant for direct applications of the approach to quality of life assessment. Sections 4 and 5 describe some indirect methods and methodological issues while section 6 concludes.

1.2 Some theoretical considerations

One rationale for drawing on the capability approach in the context of monitoring multi-dimensional inequalities derives from its consistency with concerns found in a number of disciplines. Viewing income as an input rather than the final outcome, it highlights three key elements of life quality. Firstly, the activities and states a person seeks are a function of the resources to which they have access and their abilities to convert those resources into desired states or activities. Secondly, it proposes that the subjective experience of wellbeing a person has of life depends on their activities and states. Thirdly and finally, a person's quality of life also needs to take into account the opportunities and constraints they face which define what they can, and cannot, do.

This account of life quality was developed to address some conceptual limitations in standard approaches to evaluation and offers a number of potential benefits when measuring progress in terms of human outcomes, rather than value of production. It is suited to use in practical settings and is sufficiently general to be used in settings ranging from policy interventions through to the monitoring of progress at national level. It allows for, and emphasises the fact that, quality of life is highly multi-dimensional and in applications it is clear that key dimensions vary dramatically between and within childhood, adult working life and retirement. Beyond

this, it allows for analysis of how inequalities in all these facets of life quality can arise by emphasising individual differences in terms of resource endowments as well as abilities to convert resources into valued activities and states, differences that arise from psychological, social and structural factors. In consequence, the approach can be used to emphasise the importance of what people can do but also understand how facets of life quality can come to be distributed unequally within society.

When this approach was first developed, its theoretical advantages were challenged mainly by empirical or methodological problems. Some questioned whether it would be workable on the grounds that either capabilities cannot be measured or are not often measured in the kinds of datasets that economists typically use. However, from the 1990s on, with the development and use of new data, this problem has been addressed by several researchers. For example, Anand et al (2009) have identified some pre-existing indicators of human potential in national household and demographic surveys and shown how these can be extended to cover more dimensions. Heckman et al (2001) have also drawn on psychological variables in datasets to measure what they refer to as non-cognitive skills and shown that are significant quality of life returns to the possession of these skills. In international development, Alkire et al (2013) have argued for the use of psychological scales particularly focussing on agency and empowerment while in health research, Al Janabi et al (2013), Trani et al (2011) Simon et al (2013) have all developed new measures of health that draw in some significant way on the capability approach. Based on the indicators that have been developed or used, at least five types of capability indicators can be identified (see Table 2).

Table 2. Five Types of Capability Indicators

Indicator focus	Examples
External opportunities	Are you eligible to belong to a pension scheme run by your employer? (EU-SILC) Percentage of people, aged 15 to 64, who are not working but have been actively seeking a job for over a year? (OECD-BLC)
Personal Abilities	Which qualifications do (you think) you have? (Responses from 35 items, EU-SILC) Personal trait or skill questions (eg Big-5, GRIT)
Constraints	Do you have any physical or mental health conditions or illnesses lasting or expected to last for 12 months or more? (EU-SILC) Percentage of employees working 50 hours a week or more, on average. (OECD-BLC)
Activities or States + Reasons	Have you personally moved accommodation in the last five years? (Reasons from 10 items) EU-SILC What was the main reason respondent was away from work last week? Responses from 8 items) US
Activities or States	In winter, are you able to keep this accommodation warm enough? EU-SILC Percentage of registered voters who voted in recent elections OECD-BLC

Sources: Anand et al (2009), EU-SILC questionnaires UK 2015, OECD-BLC – OECD Better Life Compendium, Understanding Society – The UK Household Longitudinal Study (US)

There is a growing tendency for surveys to shift from simple questions about activities and states to ones that require reasons also to be given. This enables activities based on preference to be distinguished from those which, in an important sense, reflect binding constraints, though in a small number of cases, it can be assumed that the preference is universal (for example do you live in a neighbourhood safe enough to walk in during the day).

These newer approaches to measurement do not depend on whether something is ‘objectively’ assessed but rather on the methodological concepts of face validity and reliability. What matters in the first instance is whether question items are plausible, direct assessments of what they purport to measure (face validity) and then whether they produce similar results each time they are used (test-retest reliability). In addition to key psychometric properties, policy applications may also raise questions about the predictive power of such indicators as well as their validity in the context of international comparisons. Different disciplines have

different norms in how they assess variables and evaluation will also depend on the research question at hand as well as the data involved. In practice, measures of capability often reflect a mix resources and personal attributes as we shall see from applications to adult and other stages of life.

1.3 Direct measures and indicators of capability dimensions

Having identified some different types of explicit capability indicators used in survey, clinical and psychological literatures particularly, we now consider some examples that exist for adults, children and seniors. As we shall see, at least some indicators are more appropriate for certain stages of the life-course.

1.3.1 Adults

For adults, there have been several specific attempts to assess capabilities and results of one example are presented in Table 3. In this case, an indicator set was designed to identify significant aspects of life quality which might be impacted by policy or monitored at national level, indicators tend to reflect both opportunity/constraint and ability aspects via steps using a list of capabilities proposed by Nussbaum (2001), focus group work, a national consultation conducted by UK's National Statistical Office and pilot work by YOUNGOV.

Table 3. Individual Capabilities for Adults in US and UK

	USA		UK	
Home (<i>"Thinking about your home life..."</i>)	Mean	S.D	Mean	S.D
I am able to share domestic tasks within the household fairly	6.64	2.90	6.11	3.12
I am able to socialise with others in the family as I would wish	6.96	2.67	6.40	2.72
I am able to make ends meet	6.36	2.93	6.28	2.76
I am able to achieve a good work-life balance	5.98	2.95	5.81	2.87
I am able to find a home suitable for my needs	6.96	2.76	6.52	2.71
I am able to enjoy the kinds of personal relationships that I want	6.40	2.92	6.16	2.90
I have good opportunities to feel valued and loved	6.92	2.73	6.26	2.77
Work (<i>"Thinking about work..."</i>)				
I am able to find work when I need to	6.97	2.70	6.50	2.75
I am able to use my talents and skills at work	7.07	2.60	6.51	2.57
I am able to work under a good manager at the moment	6.79	2.96	6.10	2.84
I am always treated as an equal (and not discriminated against) by people at work	7.39	2.69	6.78	2.70
I have good opportunities for promotion or recognition at work	5.90	3.03	4.77	3.00
I have good opportunities to socialise at work	6.72	2.76	5.58	2.72

Community (<i>"Thinking about your community..."</i>)	I have good opportunities to take part in local social events	5.94	2.86	4.95	2.73
	I am treated by people where I live as an equal (and not discriminated against)	7.60	2.46	7.09	2.47
	I am able to practice my religious beliefs (including atheism/agnosticism)	8.12	2.42	7.59	2.47
	I am able to express my political views when I wish	7.56	2.48	7.23	2.40
Environment (<i>"Thinking about your local environment..."</i>)	I am able to walk in my local neighbourhood safely at night	7.47	2.64	6.78	2.58
	I am able visit parks or countryside whenever I want	7.55	2.66	7.42	2.56
	I am able to work in an environment that has little pollution from cars or other	6.36	2.95	5.87	2.87
	I am able to keep a pet or animals at home with ease if I so wish	7.77	2.97	7.11	3.18
	I am able to get to places I need to without difficulty	7.56	2.66	6.97	2.74
Access to services (<i>When needed, I find it easy to..."</i>)	I find it easy to make use of banking and personal finance services	7.92	2.33	7.62	2.26
	I find it easy to get my rubbish cleared away	8.25	2.18	7.45	2.29
	I find it easy to get trades people or the landlord to help fix problems in the house	7.15	2.76	6.69	2.54
	I find it easy to be treated by a doctor or nurse	7.52	2.69	7.27	2.35
	I find it easy to get help from the police	7.67	2.45	6.81	2.50
	I find it easy to get help from a solicitor	6.36	2.95	6.78	2.52
	I find it easy to get to a range of shops	7.76	2.42	7.60	2.33

Notes: (i) In USA, N= 723 for Work domain response items; N=1,059 for all other domains. In UK, N= 1,243 for Work domain response items; N=1,616 for "...find it easy to get to a range of shops;" N=1,689 for all other response items (ii) Capability questions preceded by text "Here are some questions about the opportunities and constraints that you face. For each of the following statements, please indicate how much you agree, or disagree on a scale of 0 to 10, where 0 indicates you strongly disagree and 10 that you strongly agree."

Source: Anand et al (2016).

A key feature of these questions is the fact that relate to (potential inequalities) in several areas of life – the five categories of home, work, social environment, physical environment and access to services. As a result, the list provides a useful indication of how inequality measures that go beyond average income might be structured. The empirical rankings that result also help to shed light on some country differences – for example in this case, access to health care is reported easier on average under the UK's National Health Service compared with the complex system of private health insurance that applies in the US. Likewise, the

fact that rubbish removal is relatively easy in both countries suggests that structural features of the service and economy are relevant: waste removal is arguably a relatively simple service to arrange (compared to some) and one that benefits everyone in an area, not just those who are well off.

A rather different kind of example can be found in research by Ferrer et al (2014). Investigating the opportunities and constraints for healthy living through the avoidance of obesity in a poor Hispanic sub-population, individuals were asked to respond to a series of questions about resources and conversion factors. The resulting indicators of what people were able to do with respect to diet and activity were then subject to a statistical grouping analysis with results that appear in Table 4. In this study, capabilities related to diet and exercise and financial costs as well as a range of other factors including the nature of the neighbourhood, time pressure and support from family and non-family social connections.

Table 4. Capability Assessment for Diet and Activity

Subscale	Items
Convenient cost	Easy to get to store for food shopping; nearby places for outdoor physical activity; places open when I want to do indoor physical activity; fresh fruits and vegetables available where I shop for food; I can afford to buy fresh fruits and vegetables, I can afford to buy fish or lean meat; fruits and vegetables where I shop are high quality.
Neighbourhood opportunity	In my neighbourhood it is easy to walk places; places where I can be active without needing to pay; I often see other people walking in my neighbourhood, people generally feel safe in my neighbourhood; my neighbourhood is well lighted for evening activities.
Barriers	I am too tired to be physically active; illness gets in the way of cooking own meals; I am too tired to cook my own meals; feeling depressed keeps me from being active; feeling depressed keeps me from shopping for food.
Knowledge	I know how to eat health foods; when I eat at a restaurant know how to choose a health menu; I know where in my neighbourhood to shop for health foods.
Time pressure	Taking care of my family gives little time to be physically active; taking care of my family gives me little time to cook meals; my schedule gives me little time to cook my own meals; my schedule gives me little time to go food shopping; I have time to be physically active on most days.
Family support	There are people I live with who eat healthy foods; there are people I live with who are physically active; family allows me to eat recommended foods.
Spouse/partner	Spouse or partner complains when I serve a healthy meal; spouse or partner doesn't allow me to be physically active; when I plan my day, I have to think about my partner's jealousy.
Non-family support	Friends encourage me to be physically active; friends encourage me to eat healthy foods; friends keep me company when I'm physically active

Source: Ferrer et al. (2014).

Yet another approach to capability measurement can be found in work conducted by Coast and colleagues over several papers (eg Coast et al (2008)) that propose new measures of health-related quality of life.² One of these measures, designed for use with working age adults, the ICECAP A, covers feelings, social attachment as well as independence which in turn can be related to agency. Two final overall aspects relating to achievement and enjoyment reflect a philosophical distinction between *eudaimonia* and hedonic pleasure widely drawn on in psychology. While the concept of *eudaimonia* can be characterised in various ways it often refers to the development of *a sense of meaning and purpose in life*, the investment of effort in the achievement of life goals and/or involvement in activities that are personally expressive.

² See <https://www.birmingham.ac.uk/research/activity/mds/projects/HaPS/HE/ICECAP/index.aspx> (accessed 28 February 2020).

Table 5. Dimensions and Response Modes of the ICECAP A

Feeling settled	I am able to feel settled and secure in all areas of my life; I am able to feel settled and secure in many areas of my life; I am able to feel settled and secure in a few areas of my life; I am unable to feel settled and secure in any areas of my life
Love and support	I can have a lot of love, friendship and support; I can have quite a lot of love, friendship and support; I can have a little love, friendship and support; I cannot have any love, friendship and support
Being independent	I am able to be completely independent; I am able to be independent in many things; I am able to be independent in a few things; I am unable to be at all independent
Achievement and progress	I can achieve and progress in all aspects of my life; I can achieve and progress in many aspects of my life; I can achieve and progress in a few aspects of my life I cannot achieve and progress in any aspects of my life
Enjoyment and pleasure	I can have a lot of enjoyment and pleasure; I can have quite a lot of enjoyment and pleasure; I can have a little enjoyment and pleasure; I cannot have any enjoyment and pleasure

Source: Coast et al (2008).

The ICECAP family of measures are increasingly used in clinical trials and help to illustrate ways in which health related quality of life can be assessed. However, for completeness, it is also worth mentioning the approach to the measurement of capabilities that focusses on the aspect of agency, that is the ability to make and implement decisions. The concept of agency has been of particular interest to those working on international development where it has been applied to gender and inequality issues. In general, women and men are asked a series of questions about their influence on, and involvement in, household decision-making, often with respect to particular kinds of decisions. A new measure of agency directly informed by the capability approach has been developed by Alkire et al (2013) while a widely cited discussion of agency can be found in Kabeer (1999).

1.3.2 Children

The key capabilities for children may differ compared with those of adults for a variety of reasons. They may, for example, be related to parenting regimes only weakly associated with household income, to biological and psychological development stages that change swiftly in childhood, or to possibilities that extend into the future decades ahead. As a result, it is possible to think of inequalities in childhood relating to daily activities, cognitive, social and physical development as well as social mobility and there are several strands of research that are relevant in this regard. One of the first primary data exercises to assess the importance of capabilities for children is reported in a paper by Biggeri et (2006) who asked children of various ages 'What are the most important opportunities a child should have during his/her life?'. Their initial list also drew from that developed by Nussbaum but identified also additional items – notably respect, religion and identity, time autonomy and the ability to undertake projects, and mobility. With suitable longitudinal data, aspects of what a child can or might reasonably be able to do over the long run can also be assessed using data on social mobility. Often this is done using the correlation between a parent's income and that of the child. Chetty et al (2014), for example, provide evidence for the US of the probability that children from households in different parts of the income distribution will reach the top quintile of the income distribution. Based on access to a very large number of US tax records, it was found that social mobility was linked to geography, perhaps through social networks and learning, and perhaps not as large as might be expected given the cultural significance attributed to it.

Outside of economics, there is some related research on connections between social mobility and health status outcomes and evidence that welfare provision can be effective in mitigating the inequalities associated with social mobility, Matos and Kawachi (2015).

Another approach to understanding what a child can do relates to physical and mental development which can, and is, routinely tested in various ways. An example of this in the context of household panel survey design can be found in the ‘mother-child’ module of the German socio-economic panel survey. Its questions are summarised in Table 6 and have been analysed by Anand and Roope (2016) who find that skills are associated with the frequency of involvement in developmental activity, even making allowance for targeting behaviour on the part of parents.

Table 6. Skills related capability indicators for 2-3 year old children

Speaking	child speaks in full sentences; child follows instructions; child knows first and last name; child can listen attentively to stories; child can relate simple message
Everyday skills	uses a spoon to eat, without assistance and without dripping; blows his or her nose without assistance; uses the toilet to do ‘number two’; put on pants and underpants the right way round; brushes his/her teeth without assistance
Movement	child walks forwards down the stairs; child climbs jungle gyms’ and other high playground equipment; child uses scissors to cut paper; child paints/ draws recognizable shapes on paper; child can hold pen in the right way
Social relationships	child plays games with other children; child participates in role playing games child shows particularly liking for certain playmates or friends; child call his/her own feelings by name; child changes while playing (without asking)

Note: the response options in each case are: yes, partly, no.

Source: German Socio-Economic Household Panel

In a review of economic analysis in this area, Heckman and Mosso (2014) suggest that there are important connections between parenting and skill development which have been given insufficient attention in previous studies of human capital formation. Evidence on early childhood development suggests that important inequalities start to emerge and persist very early on in a person’s life and so the monitoring of multi-dimensional inequality may wish to reflect some of these childhood issues also.

1.3.3 Seniors

There is a substantial body of research on quality of life in older age and some, in recent years, specifically invokes the capability framework and tends to identify financial resources, social connections and contributions, and appropriate challenge as key dimensions of quality of life in older age (Anand (2016)). Continuity between life stage transitions and autonomy (the ability to make decisions in contexts of physical and relational dependence are also important). Finucane and Gullion (2010) offer a broad array of items for assessing decision-making competence in older age which could be useful for identifying support needs. Key themes around inequalities in older age appear to focus on income, health and the ability to have a good diet, transport options and constraints on mobility, and, as already noted, the capacity to enjoy good social relations. The ICECAP O and WHO’s Whoqol Old measures of health are broad and some of their items would be useful indicators of capabilities in older age. For instance, the Whoqol Old contains items about physical limitation, freedom to decide, feelings of control, the ability to do things that are liked, satisfaction with opportunities to continue achieving and opportunities to give and receive affection. A full picture of inequalities in older life could be expected, therefore, to go beyond income measures to look at a range of personal and environmental factors also.

1.4 Latent and indirect methods

Although governments and statistical agencies focus on the development of explicit measures and indicators for monitoring purposes, it is worth acknowledging that for analysis, where explicit measures do not exist,

other approaches can be used. For example, it has been suggested by Martinetti (2000) that fuzzy set theory could be used to reflect the fact that whether a person has a particular capability might not always be unambiguous and perhaps more a matter of probability than of certainty. Such latent class techniques have also been explored in a series of papers, for example by Di Tomasso (2007) and Krishnakumar (2007), who both apply latent variable techniques to the understanding of child wellbeing. These techniques do not generate the statistical indicators required to monitor trends directly but may nonetheless be of value when conducting policy analysis.

1.5 Dimension selection and indexation

Which capabilities should be measured is a question to which significant attention has been given though there is no single correct answer as this depends on policy objectives and social priorities. Nonetheless, as noted, international organisations are increasingly identifying themes that reflect significant overlapping consensus about the important quality of life dimensions that should be monitored. Perhaps only the most important aspects of inequality can be assessed with the data currently available but it is clear that inequalities can be found in domains relating not just to work and access to services but also to home, the physical environment and the social communities within which people live. Considering whether there are quality of life indicators in each of these domain groupings is one way to assess the comprehensiveness of coverage of any set of indicators, but it may also be useful to consider where inequality indicators might be needed for particular issues (for example disability and inclusion) or groups known to be at risk of social exclusion. The EU has a rich set of member state social and public agendas on which to draw from which a common core of inequality indicators might be drawn. Furthermore, the extent to which different aspects of inequality will be correlated with economic inequality is likely to vary significantly as some will be more related to social and political factors. To fully understand multi-dimensional inequality, it may be helpful to select indicators that vary in their connections to economic inequality.

A final issue considered here is how best to create an index of multi-dimensional inequality if feasible and warranted. As a starting point, a dashboard of inequality measures comprised of univariate inequality measures for the EU is likely to be useful and insightful though it is also interesting to consider whether for each country, say, a measure of multi-dimensional inequality could not also be constructed. Such a measure would implicitly make assumptions both about the nature of inequality within each dimension and also the relative weight each dimension contributes to total inequality. There is an academic literature on this, see for instance references in Decancq and Lugo (2013) though Aaberge and Brandolini (2014) provide some cautionary notes about indexation. In practical settings, the UN's Human Development Index (HDI) has published its dashboard along with its index allowing the latter to be based on equal weights between dimensions. Such weighting may be justified on the grounds that the dimensions are important to society and there is insufficient reason to give some more significance than others.

Several approaches to indexation have been developed though as yet few have been applied widely in policy or research. Given this fact, it might be argued that tractability, familiarity and ease of understanding are likely to be important and asked therefore, whether the Gini index, standard for assessing economic inequality, can be extended to the multi-dimensional setting.

In fact, and as Gajdos and Weymark (2005 p 490) show, a multidimensional Gini inequality index can be the average value of the Gini coefficients on component dimensions, and is consistent with a number normative criteria. Another approach developed by Yalonetzky (2012) offers a development of the Human Opportunity Index devised by Barros et al (2009) suitable for multi-nomial distributions (and therefore ordinal data). Such an approach might be less familiar than one based on GINI but does have some desirable properties also. Finally, it is worth mentioning the UN's approach which has been applied to the assessment of gender inequality (Gaye et al (2010)). Based on a simple inequality index it uses a five step procedure that aggregates across dimensions within each gender group, using geometric means, and across gender groups using a harmonic mean. These three approaches seem particularly natural ones to explore further in the policy context of multi-dimensional inequality measurement though others do exist - see Decancq and Lugo (2013) for discussion. While this paper has concentrated on ways in which a dashboard for monitoring multi-dimensional inequalities can be developed using a capability approach, it is important to recognise that the creation of an index remains a useful device for focussing discussion and attention.

1.6 Concluding remarks

In summary, there are several ways in which capabilities can be directly assessed or measured. What people are able to do in different domains and on different dimensions is important because quality of life is fundamentally multi-faceted. Furthermore, while many things tend to be correlated with income, the relationship is often not very close: moreover, dimensions of interest vary over the life course. Looking at the dashboards of inequalities by issue, for groups, and by country, as well as over time, is therefore important for fully understanding inequalities. Dashboards enrich understanding beyond use of single variable measures though for communication purposes, an index can also be effective and there are several possible ways in which such an index might be created.

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2 Exploring the links between the capability approach and the analysis of multidimensional inequalities and disadvantages (by Enrica Chiappero-Martinetti³)

*I conceive that there are two kinds of inequality among the human species;
one, which I call natural or physical, because it is established by nature,
and consists in a difference of age, health, bodily strength,
and the qualities of the mind or of the soul:
and another, which may be called moral or political inequality,
because it depends on a kind of convention,
and is established, or at least authorized by the consent of men.
This latter consists of the different privileges,
which some men enjoy to the prejudice of others;
such as that of being more rich,
more honored, more powerful or even in a position to exact obedience.
[Jean Jacques Rousseau, 1754:16]*

2.1 Introduction

After decades of inequality analysis which concentrated on income inequality, and the persisting attitude of economic analysis to favour money metrics, in recent years growing attention has been attributed to the multidimensional analysis of well-being, quality of life and poverty. Relatively less explored is the field of multidimensional inequalities, with some relevant exceptions (Roemer, 1998, 2002, 2009; Peragine, 2004; Peragine et al, 2014; Ferreira and Peragine 2015; McKnight et al, 2019; UNDP, 2019). The aim of this paper is to describe some distinctive elements of the capability approach in light of its possible application to multidimensional inequalities analysis. Strengths and challenges of this framework are discussed, shedding light on what conceptual advantages this approach can offer and the methodological difficulties involved.

2.2 Inequality of what and inequality among whom

Micro-economic analyses traditionally narrow down the concept of inequality to the rather limited space of income. Different arguments have been provided to support this decision, some are based on normative reasons – individual disposable income is a general neutral metric of “control over resources” a person has – and others are based on empirical motivations – there are some obvious advantages in handling a single, simple piece of information.

Income is, undoubtedly, an easy-to-manage and consolidated metric, it is relatively reliable (or supposed to be reliable) and easily available nowadays thanks to the growing number of households surveys; furthermore, it can be applied to statistical tools and consolidated methodologies that work well with continuous variables and large datasets. However, as demonstrated by an extensive empirical literature, there is actually neither a deterministic nor an unambiguous relationship between income and other relevant dimensions of individual wellbeing (such as, education, health, but also individual freedom and rights or even happiness) that can justify such a persistent use of income as a far-reaching proxy for measuring well-being.

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Associated to the limited view of income inequality is the equally restricted assumption that there is an archetypal individual – the representative agent – without a specific identity or subjectivity so the only way to distinguish one person from another depends on his or her different income.⁴ As for the income-based metric, the representative agent assumption considerably simplifies the empirical analysis of inequality as it only allows for differences in the available amount of personal income to matter. To a certain extent it also validates the traditional approach to income inequality measurement, which usually focuses on vertical inequality – interpersonal income differences between the rich and the poor – and on relative inequality – pairwise comparisons of individual incomes, as in the case of the Gini index, or by comparing individual incomes to the mean.

From the empirical point of view both simplifications – single metric and representative agent – offer the obvious advantage of streamlining the inequality analysis but at the risk of neglecting the fact that people are different in many respects and that these differences may have important consequences on well-being and inequality. As pointed out by Sen (1992, p. 29): “this strategy of inequality measurement, thus, incorporates the restrictive feature of treating everyone’s income symmetrically no matter what difficulties some people have compared with others in converting income into well-being and freedom”.

Though income remains one of the most recurring metrics for measuring inequality, in recent years, many economists have increasingly acknowledged the importance of skipping the risk of ‘resource fetishism’ and enlarging the perspective by encompassing additional evaluative spaces. Therefore, it is now increasingly common for distributive analyses to associate, rather than to substitute, income disparities in other spheres such as health, education, housing, material deprivation or life satisfaction offering a broader view of the way in which our societies are unequal in different spheres.

Similarly, more attention is now reserved to several sub-groups of the population that are considered particularly, potentially or systematically disadvantaged according to certain personal characteristics (these being either because of gender, age or ethnicity) or due to specific conditions (e.g. migrants, disabled people). Horizontal inequalities tend to be persistent and become a source of social exclusion and discrimination; therefore, it is worth paying attention to inequality across groups (i.e. men vs. women, youth vs. elderly); yet, once more the implicit assumption is that within a given group all individuals are basically the same.

The arguments in favour of a unique money metric are not dissimilar even when a macro, countrywide perspective is assumed to measure the standard of living or inequality and national account measures such as GDP or GNP are used as a proxy.⁵ The debate towards official social indicators has evolved in a similar way, further reinforced on the environmental side, and aimed at integrating and reinforcing the limited money metric view.

A major boost in this direction has come thanks to the contribution of ad-hoc commissions aimed at reflecting the limits of GDP and suggesting a broader account of well-being. This has been the case, for instance, of the Sarkozy Commission and the subsequent panel of experts on the measurement of economic performance and social progress led by Stiglitz, Fitoussi and Durand.⁶ In addition, the International Panel for Social Progress, with more than 300 academics in dialogue on what the key dimensions of social progress are.⁷ Both commissions provided good arguments in favour of a dashboard of indicators which also reflected on how large the dashboard should be (‘small enough to be easily comprehensible, but large enough to summarise what we care about the most’, Stiglitz et al. 2018a:13) and on what should be on it (i.e. based on a national dialogue). In general, gathering an ordered set of indicators is considered to be a good way for shading light on the manifold dimensions of well-being and for monitoring the trends of development or socioeconomic progress.⁸

⁴ As outlined by Alacevich and Soci (2018), although in a different way neither the neo-classical assumption of the representative agent nor as the focus on social classes of classical economic theory, allows space for, or pays attention to, human diversity.

⁵ On the acknowledged shortcomings and the long-standing debate on the inadequacy of these indicators to represent living standards and progress see, among others, Stiglitz et al (2018) and Fleurbaey and Blanchet (2013).

⁶ See the two volumes edited by Stiglitz, Fitoussi and Durand on ‘Beyond GDP: measuring what counts for economic and social performance’ (2018a) and the companion report ‘For Good Measure: Advancing Research on Well-being Metrics Beyond GDP’ (2018b).

⁷ The panel produced a three-volume report on ‘Rethinking Society for the 21st Century’ (ISPR, 2018a, 2018b, 2018c) and ‘A manifesto for social progress. Ideas for a better society’ (Fleurbaey et al., 2018).

⁸ The platform of the Global SDG Indicators Database provided by the Inter-Agency and Expert Group on SDG Indicators (IAEG-SDGs) is the most recent and ambitious attempt to provide a broad and articulated dashboard of indicators with a worldwide coverage. Other well-known examples of dashboards are the World Bank Indicators or the overarching portfolio of EU social indicators.

A multidimensional account of wellbeing is also advocated from those who suggest gathering various indicators into a composite index, in which GDP is often one component associated to other dimensions.⁹ Composite indexes of poverty and well-being are often formulated with the aim of facilitating comparisons over time or across countries, to simplify interpretation and communication and to support decision-makers. They also encourage a more parsimonious choice of the relevant information to be included in the overall index reducing the excessive richness that often characterizes any dashboard. Nonetheless, they are not without criticism concerning their lack of analytical foundations, the large number of methodological arbitrary choices implied (in terms of choice of indicators, manipulations required for the data harmonization, normalization and aggregative techniques applied, system of weights and trade-off among indicators, etc.), the comparability and quality of data used for such indexes when a large set of countries is covered.¹⁰

Ravaillon (2010a) outlines that most of the “mashup indices”¹¹ currently used are rarely rooted into a prevailing theory or grounded on robust methodological assumptions. They are generally driven, or affected by, the availability of statistical data and composed without providing a satisfactory justification of the full range of measurement problems implied in their construction. This can lead to misinterpretation and potential manipulation of results and may have important policy implications.

Certainly in the case of composite indexes but even in the (apparently less complex and problematic) dashboard approach, there is clearly the necessity of anchoring what apparently are considered purely or mostly ‘technical’ decisions to a theory or a conceptual framework, that can provide a guide on the selection of dimensions and the systematization of the relevant information, to drive the methodological choices and interpret the results in the light of a solid theoretical frame. This requirement should be even more relevant when the focus of our investigation is on inequality, on its multiplicity of dimensions and the heterogeneity of characteristics and circumstances that characterize human beings.

2.3 The capability approach as an intrinsically multidimensional and complex scheme

As outlined, there is a growing consensus about the need to offer a broad-ranging account of well-being and development.¹² The capability approach which was introduced in the mid ‘80s pioneered by Amartya Sen (1985, 1987, 1992, 1993, 1999, 2009) and Martha Nussbaum (1997, 2000, 2003, 2011. See also Nussbaum and Glover, 1993), can help to conceptualise and investigate multidimensional well-being in its intrinsically complex nature and from a broader perspective.¹³ In Sen’s words ‘the capability approach focuses on human life, and not just on some detached objects of convenience, such as income or commodities that a person may possess which are often taken, especially in economic analysis, to be the main criteria of human success. Indeed, it proposes a serious departure from concentrating on the means of living to the actual opportunities of living.’ (Sen 2009, p. 233)

There are some distinctive elements of this approach that are worth summing up. As clearly emerges from Sen’s quote, it is important to keep means and ends separate and consider people’s valuable capability as ultimate ends (Robeyns, 2017). Monetary resources, being income, wealth or consumption, are essential means in the well-being process. Other available resources, such as public and common goods and non-market production (e.g. care and domestic activities generated by unpaid work), are equally important but usually neglected or not sufficiently considered in the evaluation exercises. All these means play a relevant

⁹ The most popular are probably the Human Development Indexes, formulated by UNDP since 1990 and then revised in 2010, together with others such as the Index of Economic Well-Being (IEWB), the Social Sustainability Index (SSI) and the OECD Better Life Index. For an overview of different data sources and an indicator of social progress see also the wikiprogress platform (<https://en.wikipedia.org/wiki/Wikiprogress>).

¹⁰ For a critical discussion of some prominent composite indexes see Ravaillon (2010a, 2010b and 2011). See also Chiappero-Martinetti and von Jacobi (2012). More specifically on the human development indexes see Anand (2018) and Klasen (2018).

¹¹ These are defined by Ravaillon (2010a:3) ‘as a composite index for which the producer is only constrained by the availability of data in choosing what variables to include and their weights’.

¹² For a discussion on alternatives to GDP see Fleurbaey and Blanchet (2013). For a comparison among different multidimensional approaches to human well-being see Alkire (2002).

¹³ What can appear, at first sight, a natural ‘competitor’ of the capability approach, is the equality of opportunity theory. First formulated by Roemer in the ‘90s (Roemer, 1998, 2002, 2009) this approach has generated a fast-growing development of analytical and empirical work. Some commonalities between these two approaches exist as well as some substantial element of distinction on a conceptual level with implications on the empirical side. On this see Chiappero-Martinetti (2009), Kanbur (forthcoming).

role in the well-being generating process however they are not the final ends.¹⁴ What ultimately matters from a capability perspective is what people can do with these means, and what opportunities do they have to pursue their own goals and aspirations.

Entrenched in this definition is the notion of individual agency, which enables individuals to be empowered and gives them the ability to realize their own life plans. Coherently with the distinction between capability and functioning, in the definition of agency we can also make a distinction between agency freedom and agency achievement. Agency freedom refers to the potential a person has to pursue 'whatever goals or values he or she regards as important' (Sen 1985: 206). While according to Sen, the individual's agency achievement 'refers to the realization of goals and values she has reason to pursue, whether or not they are connected with her own well-being' (Sen 1993: 37). Agency enables people to expand their freedoms and "[freedom] is also a principal determinant of individual initiative and social effectiveness." (Sen, 1999, p.18). Thus freedoms and agency are mutually enhancing components of development as a greater freedom enhances the ability of people to be agents, while agency also enables people to claim and achieve more freedoms allowing them to contribute both to their own personal development and to that of their community (von Jacobi et al, 2019).

A further distinctive aspect is that the capability approach acknowledges the high degree of heterogeneity in personal features such as sex, age, ethnicity or physical conditions, which makes each person substantially different from anyone else. Thirdly, but related, two individuals might share the same set of internal characteristics but live in different households, in diverse socioeconomic, cultural and natural environments. The combination of these different personal and contextual features generates a diverse capacity to convert the available resources into real opportunities and achievements.

2.4 Can the capability approach be of help in investigating multidimensional inequalities?

The capability approach has been used for a wide-range of purposes and types of analysis: even by just limiting the attention to the operationalization and empirical applications of this approach, in the last ten years the number of contributions has grown dramatically, ranging from the assessment of standards of living and quality of life (e.g. Bérenger and Verdier-Chouchane, 2007), to multidimensional poverty and well-being (e.g. Alkire et al., 2011) or agency and empowerment (e.g. Clark et al., 2019) to sectorial papers on health and disability (e.g. Coast et al, 2008; Lorgelly et al, 2015; Mitra, 2006; Mitchell et al, 2017), or education (e.g. Hart, 2007 and 2014; Hart and Brando, 2018), to specific groups, particularly women (e.g. Bérenger and Verdier-Chouchane, 2011; Walker et al., 2013; Addabbo et al, 2010), children (e.g. Biggeri et al. 2011; Mishra et al., 2018) or youth (Otto, 2015; Atzmüller et al., 2017).

Relatively few attempts have been developed to apply the capability approach to multidimensional inequality analysis. Recent remarkable exceptions are the Multidimensional Inequality Framework (see McKnight et al., 2019)¹⁵, a useful tool based on the capability Approach that can help design measures of multidimensional inequality, and the last Human Development dedicated to inequalities in human development (UNDP 2019). What can we learn from these experiences? What further steps can be taken to get a better account of multidimensional inequalities? Why and to what extent can the capability approach be helpful to conceptualize, contextualize, detect and describe multidimensional inequalities? What policy implications can be drawn from such a broader view?

We think that some distinctive elements of the capability approach briefly mentioned in the previous section deserve attention and allow for a better understanding of multidimensional inequalities and its multiple causes.

Firstly, the inclusion of both evaluative spaces of capabilities and functionings in the empirical analysis can help to reveal some pervasive gender inequalities in our societies and to understand to what extent a person is really free to choose what he or she values. Is the low female participation rate on the labour markets or the limited presence of women in the political arena (both in terms of parliamentary seats or as political leaders) or even the low fertility rates that we can observe in certain countries (and Italy is certainly a representative case in all these three examples) the result of a free choice of women or it is rather the

¹⁴ As outlined by Robeyns there are important ends for individual wellbeing, such as self-esteem or friendship that might only marginally depend on material means (see Robeyns, 2017).

¹⁵ This framework drawn on the Equality Measurement Framework (Burchardt and Vizard, 2011). See also Burchardt and Hick (2017).

consequence of their limited set of options, in some cases the only available option? If disparities in the achievements is the result of persistent disparities in the space of opportunities, policy should be addressed to equalize the opportunities. In our example, focus should be on tackling the discriminations that may exist on the labour market or in the policy arena between men and women, on reducing the time-constraints women face in conciliating parental responsibilities, on the one hand, and professional career or active engagement in the political life, on the other hand. On the contrary, if the observed outcomes are genuinely the result of women preferences, the interpretation would be clearly different, and policy should not interfere in the realm of individual choices.

Secondly, keeping a clear distinction between means and ends is important for empirical as well as for policy reasons. If a broader and multidimensional perspective such as the one offered by the capability approach were adopted, it would quickly become evident, for example, that inequalities in education and health, career and job opportunities or individual autonomy are as persistent and even more morally unacceptable than, income disparities, though not necessarily or automatically correlated with them. Furthermore, it would become even clearer that aspects such as economic downturns and social transformations can exacerbate the inequality of opportunities and outcomes of groups that are already disadvantaged, underscoring that horizontal inequalities matter just as much as vertical ones. In addition, some capabilities can be only partially, or even not at all affected, by material resources (i.e. income), while can benefit from intangible resources such as legislations and institutions that promote, for instance, women quotas in case of political participation, or family-friendly work arrangements within firms and workplace solutions for childcare in fertility decisions and labour market participation. In this perspective the relevant question becomes: ‘which types of means are important for the fostering and nurturing of a particular capability, or set of capabilities?’ (Robeyns, 2017:51).

Thirdly, inequalities can be the results of an unfavourable conversion process. As outlined before, it is worth understanding how the conversion factors – both internal and external – combine and interact with each other and what the joint effect played by resources and conversion factors in the actual achievements is – what we have defined in other works as “conversion rates” (Chiappero, Salardi and Scervini, 2018, 2019). It is not a single factor that determines individual advantage or disadvantage, but rather the combination and interrelation between personal characteristics and a plurality of contextual factors that affect the position of the individual in society and generate unequal opportunities and unequal outcomes. Being a woman, or a disabled person, or belonging to a minority ethnic group does not automatically mean that one is (or must be) disadvantaged, even if it might be rather recurrent to find a higher concentration of disadvantaged people in these groups. Rather, it is the interaction between these personal characteristics and other external factors – including family socio-economic background, geographical location, cultural norms and institutional factors – that contribute to exacerbate or reduce inequalities. A disabled person who grew up in an encouraging household context and in a non-discriminated social environment, with the support of ad-hoc and adequate resources can well realize her full potential and do and be what she values. The distinction between internal/personal and external/contextual conversion factors can be of relevance even for policy purposes; in principle, personal characteristics such as sex, age, ethnicity or disability cannot be modified. As such, interventions can, at best, go in the direction of preventing discrimination and compensate for these disadvantageous conditions. On the contrary, contextual factors are shaped by social norms and institutions and can be the object of policy intervention. On this front the agency dimension can be equally relevant, as individual and collective actions can contribute to changing social structures and social norms that can be detrimental in perpetuating marginalization and inequality.

Finally, the adoption of such a broad and holistic frame suggests paying attention on how inequalities and disadvantaged conditions can persist and cumulate across dimensions. On this regard, the definition of disadvantage suggested by Wolff and De-Shalit (2007) and formulated in terms of functionings can be of help. They define disadvantage “as lack of genuine opportunity for secure functionings” (p. 182), emphasizing that it is not just important what people can actually achieve but also the vulnerability and risk they may have of losing these achievements or not being able to sustain them over time. Equally important is seeing the interlinkages across dimensions and particularly what they define as a ‘corrosive disadvantage’, that is when a disadvantage in one dimension cumulates or generates unfavourable conditions in other related domains, and ‘fertile functionings’ when, on the contrary, achievements in one dimension may have a positive impact on other dimensions as well. These definitions can easily be transposed in the space of inequalities, paying attention to how patterns of inequalities originate and why they persist; what are the dimensions where inequalities can cumulate and their combination can make life much harder than just the sum of single disadvantages; and in which dimension can a reduction on inequalities have a positive impact on other dimensions as well.

2.5 To conclude

While there are good reasons for going beyond the simplified and somewhat unrealistic hypotheses of the representative agent and the suitability of the money metric, how to do it is neither easy nor obvious. The easiest and most recurrent solution is simply to add other variables to the income-based measure and, at best, associate inequality across dimensions with a description of inequalities across sub-groups of population. This solution goes towards the acknowledgement that inequalities are more than simply income disparities and they can be concentrated in specific groups of the population.

Measuring multidimensional inequalities clearly implies a growing degree of complexity both at a conceptual and methodological level. We think that a more promising, although more challenging, solution is to refer to a robust theoretical framework that can be a guide light in the many methodological steps and choices required and can help to interpret the empirical results and the policy implications.

The comprehensiveness developed in the theoretical formulation of a concept has to be somewhat separated from the technical matters involved in the translation of the concept into a quantitative or qualitative measure. The two levels of complexity can (though not necessarily must) be closely linked, but it is important to distinguish between concepts that are genuinely simple and concepts that are instrumentally made simple for empirical reasons but that are actually theoretically complex. Strong simplifications, which are usually introduced by the empirical implementation of complex concepts, are typically justified by resorting to various arguments – such as: the scarcity of statistical data, the impossibility of carrying out expensive ad hoc surveys, the fact that some dimensions are unobservable or only partially and indirectly measurable, or the lack of adequate measurement tools. Without denying the existence of these constraints, we believe that the intrinsic complexity of a concept should be first and foremost acknowledged at the theoretical level.

As we have attempted to show in this paper, the capability approach can represent an interesting and appropriate frame for conceptualizing, contextualizing and understanding multidimensional inequalities. What is worth noting is that in this approach, the multidimensionality goes well beyond the prescription of just accounting for plural dimensions in well-being assessment; it involves other fundamental aspects and layers of analysis that calls our attention on the entire process of well-being rather than just on one single component of the whole frame. Capabilities and functionings are, per se, multidimensional spaces that involve a plurality of dimensions (health, education, nutrition, housing, social interactions, political participation, just to mention the most common ones) that can be further articulated into sub-dimensions (e.g. bodily health and physical integrity, mental and psychological health, reproductive health, impairments, disabilities) and assessed by using a wide range of qualitative and quantitative variables to be used as proxy for resources, opportunities and achievements. And finally, the way in which the capability approach conceives human diversity is intrinsically plural and requires considering how relevant personal and contextual conditions combine. It might not be possible or even not required or necessary to apply this framework in all its components and complexity but yet it might be worth being guided by this framework.

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3 Lifetime perspectives on inequality (by Giacomo Corneo¹⁶)¹⁷

3.1 Introduction

When philosophers, e.g. in the tradition of John Rawls, discuss issues of distributive justice they are typically concerned with the way in which the distribution of resources affects the life plans of individuals. Similarly, economic theorists are chiefly interested in the inequality of people's opportunity sets, and these are usually conceived of as long-run sets, covering the bulk of people's lives. Since the seminal works by Franco Modigliani and Milton Friedman back in the 1950s, most economists believe that this fundamental type of inequality is best gauged by the notion of lifetime income or permanent income.

Despite the theoretical appeal of a lifetime perspective, most research on income inequality has concentrated on how annual incomes are distributed. This is often explained by data requirements: while the data required to study lifetime inequality is hard to come by, plenty of information about cross-sectional distributions of annual incomes is available. However, such distributions cannot be expected to reveal much about unequal life opportunities because they are merely snapshots extracted from empirical samples that include people at very different stages of their life cycles and work careers. They include 20-years-old apprentices and their 60-years-old superiors; they include employees who in that particular year were lucky enough to receive extra bonuses and employees who in the very same year were temporarily put on reduced working time and reduced pay. Furthermore, those annual distributions only include those who are alive in that year, and therefore fail to capture the inequality of life opportunities that is caused by differential longevity. In sum, analyses of distributions of annual incomes cannot deliver a reliable picture of those fundamental lifetime disparities in material well-being many social scientists and policymakers are interested in.

A response of some researchers to this state of affairs has been to develop microsimulation models that attempt to extrapolate income biographies out of actual income information pertaining to a small number of years.¹⁸ While this has considerably increased scholars' awareness of the limits of annual income distributions as descriptions of long-run income inequality, the results put forward by this literature remain highly hypothetical because of the far-reaching assumptions on which they necessarily rely. Concerns about the empirical relevance of such simulations are driven by doubts about their underlying theoretical frameworks – e.g. assumptions of full intertemporal optimization under rational expectations, perfectly competitive markets, some particular form of market incompleteness, fixed and time-consistent preferences of some particular type. Results from this strand of literature also hinge upon the particular stochastic processes posited w.r.t. the shock structure affecting the agents during their life cycle – e.g. affecting the evolution of their hourly wage, employment status, and family composition.

Thanks to the digitalization of earnings data from social security in various countries, as well as the availability of a growing number of years of register data and panel data, researchers are getting in a better position to measure actual lifetime incomes or at least long-run incomes in a variety of settings.¹⁹ This increasing data availability has produced major advances in the understanding of lifetime inequality. Actual data on lifetime incomes, beyond their fundamental descriptive value, are also increasingly helping the simulation literature to develop structural models on firmer empirical grounds. The aim of this paper is to present the main insights from the current research on income inequality that takes a lifetime perspective and grounds on actual income data.

When assessing income inequality from a lifetime perspective, a decision must be made about the definition of the group of people for which inequality will be measured. Lifetime income should be a comparable measure of material well-being for all individuals that constitute such a group. A cardinal observation in this respect is that the set of products and markets on which income can be spent, the set of public goods and the set of public bads, and the set of publicly-provided private goods and services substantially change over time in any given country. This means that using lifetime incomes to assess inequality of material well-being

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¹⁷ This paper owes much to several discussions with Timm Bönke and Holger Lüthen. The responsibility for remaining shortcomings is only mine.

¹⁸ See e.g. Bowlus and Robin (2012), Heathcote et al. (2005), Hugget et al. (2011), Levell et al. (2016).

¹⁹ The pioneering paper on actual income biographies is Björklund (1993). He computed lifetime incomes for a small sample of Swedish men born between 1924 and 1936. Recent work along similar lines but based on much larger samples includes Bönke et al. (2015) on lifetime earnings in Germany and Guvenen et al. (2017) on 30-years earnings inequality in the USA; see also Kopczuk et al. (2010).

makes most sense for a set of individuals who are alive during the same years. For this reason, most research in this area follows a cohort approach by which individuals are grouped together according to their year of birth and lifetime income inequality is assessed for each birth-year cohort separately.²⁰

In what follows, I will focus on the strongest results on lifetime income inequality that were obtained from the analysis of data on income biographies in Germany, the country for which lifetime incomes can be observed for the largest number of cohorts. In a preliminary step in section 2, I will briefly present the theoretical framework that underpins the empirical studies in this area. The subsequent section 3 will discuss the main empirical findings concerning working-life incomes, i.e. the present values of incomes received during the active part of the life cycle. Section 4 will extend the analysis so as to take the retirement period into account; this generates valuable insights into the lifetime income redistribution produced by the overall tax-transfer-system and on the role played by differential mortality in shaping lifetime disparities. The final section will address several open issues and sketch a few extensions of the lifetime approach that are likely to be pursued by researchers in the near future.

3.2 Lifetime income as a multidimensional object

Lifetime income is income received over the course of a life, i.e. it is determined by the sequence of incomes that are made available to the individual at different points in time during the individual's lifetime. These incomes enable the individual to purchase market goods and determine the material well-being derived from such goods during the individual's life. If the length of life is measured in years and all annual incomes can be observed by the researcher, the sequence of annual inflation-adjusted incomes (i.e. real annual incomes) constitutes the multidimensional primitive object (a vector) in any analysis of lifetime income inequality. Lifetime income is an index that captures the well-being relevant information contained in such a sequence of annual incomes.

A naïve approach to defining lifetime income has it equal to the sum of the real annual incomes. This approach is only appealing for the study of societies in which individuals cannot transfer consumption entitlements across periods so that they have to consume every annual income in the year when it is received. In economies with a developed financial sector, most individuals can transfer consumption entitlements across time by saving and dissaving, receiving an interest rate on their savings and paying one when they borrow. In this case, the material well-being over an individual's lifetime is determined not only by the sequence of annual incomes but also by the relevant interest rates.

This latter approach has a longstanding tradition in economics where it underpins the so-called *life-cycle model of consumption*.²¹ This model portrays an individual or a household that faces a number of per-period budget constraints, linked to each other by the saving and dissaving decisions of the agent. Through successive iterations of the single-period budget constraints, their sequence can be collapsed into an intertemporal budget constraint of the following kind:

$$\sum_{t=0}^T \frac{c_t}{(1+r)^t} = \sum_{t=0}^T \frac{y_t}{(1+r)^t} \quad (1)$$

On the left-hand side appears the present value of consumption which the individual enjoys from some initial year 0 to some final year T and discounts at the annual rate of interest r . On the right-hand side you find the corresponding present value of incomes. Importantly, such incomes y do not include the remuneration of savings and the payment of interest on borrowings because such elements disappear when you consolidate the single-period budgets constraints into the intertemporal one. In essence, the incomes y on the right-hand side are gross earnings minus taxes and social contributions plus social transfers. To the extent that these incomes can be observed by the researcher, the present value on the right-hand side of (1) can be used to measure the value of the resources that the individual can consume during his or her lifetime, i.e. the value of the individual's lifetime opportunity set.

²⁰ A further argument in favor of such an approach relates to the importance of relative needs and the empirical finding that individuals tend to compare their incomes with those of people of similar age (see e.g. Pérez-Asenjo, 2011).

²¹ See e.g. Attanasio and Weber (2010).

Eq. (1) offers a first approximation to the notion of lifetime income that can be improved upon in several ways. To begin with, the interest rate is not time-invariant but substantially changes over the course of an entire life cycle. Acknowledging this, the intertemporal budget constraint becomes:

$$c_1 + \sum_{t=2}^T c_t \prod_{j=2}^t (1 + r_j)^{-1} = y_1 + \sum_{t=2}^T y_t \prod_{j=2}^t (1 + r_j)^{-1} \quad (2)$$

where the interest rate is allowed to change from one year to the next. A further improvement on the definition of lifetime income obtains once you incorporate the notion that longevity differs across individuals and is uncertain. This can be captured by a survival function S that for every year defines the probability to reach the end of the year, contingent on the individual having survived until the beginning of that year. If individuals can insure their consumption in a mathematically fair fashion, one can compute their expected lifetime income as follows:

$$S_1 c_1 + \sum_{t=2}^T S_t c_t \prod_{j=2}^t (1 + r_j)^{-1} = S_1 y_1 + \sum_{t=2}^T S_t y_t \prod_{j=2}^t (1 + r_j)^{-1} \quad (3)$$

The right-hand sides of equations (1)-(3) are increasingly precise measures of the lifetime consumption opportunities faced by individuals. Depending on data availability, these measures are employed by the literature in order to assess lifetime inequality. Notice that all measures were derived independently of any notion of utility and optimization; they simply follow from the institutional rules of private property that imply the sequence of per-period budget constraints faced by the individuals. Nevertheless, a few caveats are in order. Strictly speaking, the intertemporal budget constraints exhibited above only hold if capital markets are perfect. In reality, credit is rationed and the interest rate at which individuals can borrow money is higher than the interest rate that remunerates their savings. This means that the scope for averaging consumption over time is reduced. Furthermore, markets for annuities (required for Eq. (3)) are not perfect in reality and families cannot perfectly substitute for them. In countries with a developed welfare state the ensuing restrictions are mitigated by means-tested benefits and public pensions. In these cases, the formulas presented above may be viewed as an acceptable first approximation. A further qualification pertains to the role of bequests – that do not appear in the equations above but could easily be introduced. In reality, many individuals receive bequests that they can use for own consumption or for leaving bequests themselves – which can be interpreted as a special way the individual consumes his or her lifetime resources. A better measure of material well-being would thus be the sum of the lifetime income and the present value of the inheritances and gifts received by the individual. Unfortunately, it is hard to find datasets that include information on both, yearly incomes and inheritances and gifts, over entire life cycles. This also applies to the dataset that I am going to use in the next section.

3.3 Working-life income inequality in Germany

In a forthcoming paper with Timm Bönke and Holger Lüthen (Bönke et al., 2020) we study actual lifetime income inequality for cohorts of West-German men born after 1935. Our analysis grounds on administrative data from the German social security system, known as *Versicherungskontenstichprobe*. This is a rich dataset that includes monthly information about earnings, employment status, sickness and other variables of interest for some 240,000 individuals. The sample we investigate is highly representative of some 80 % of the male West-German labor force.²² In order to compute post-fisc lifetime incomes we have built a detailed microsimulation model that depicts the evolution of the tax-and-transfer system of the Federal Republic of

²² A detailed discussion of this dataset and our sample can be found in Bönke et al. (2015). In that article we also report the main empirical findings that pertain to the female labor force.

Germany since 1952. By feeding this microsimulation model with the information from the social security mentioned above we obtain nominal individual post-fisc incomes on an annual basis. We define *working-life incomes* as incomes received between age 20 and age 60. In order to discount them we use a time series of average nominal interest rates on federal governmental bonds in Germany. This information allows us to compute the right-hand side of the intertemporal budget constraint (2) in the previous section.

Our computation method treats all individuals as if they were singles. To the extent that one is interested in the inequality of lifetime opportunity sets, this is arguably the most satisfactory way to proceed because family formation already entails a special way of making use of one's opportunity set. In other words, the working-life income we compute should be interpreted as a measure of the value of the opportunity set faced by the individual before the individual makes any decision about forming a family.²³

We assess distributions of lifetime incomes at the level of cohorts, where a cohort is defined as the set of all individuals born in the same year. Equipped with this data and methodology, we have produced several remarkable insights.

Insight N°1: Cohorts' working-life income inequality is about 3/4 of their annual income inequality.

Analyses of annual incomes severely overstate the extent of lifetime income inequality: we find that the Gini coefficient of a cohort's working-life incomes is about one fourth lower than the average of the Gini-coefficients of the distributions of annual incomes for that cohort during its working life. On average, shifting from an annual to a working-life perspective reduces the Gini coefficient from about 0.21 to about 0.16. Such a substantial reduction of measured income inequality is due to the intra-generational mobility of the individuals during their life cycle in the yearly income distributions. By way of an example, think of an income-poor university student becoming a well-paid manager when he is in his fifties. This type of income mobility makes lifetime distributions much more compressed than annual distributions.

Insight N°2: Annual intra-cohort income inequality displays a U-shaped pattern over the working life and reaches approximately the same minimum again when a cohort is retired.

Intra-cohort income inequality strongly varies with the cohort's age: it is large both at the very beginning and at the end of its working life because in those years a significant fraction of the cohort does not participate in the labor market and correspondingly receives transfers that are significantly lower than net wages. So, the Gini coefficient of annual incomes is in the range 0.3-0.4 both when a cohort enters its twenties and when it enters its sixties. When the entire cohort is retired (typically after age 65) and every individual receives a pension or social assistance, annual income inequality is approximatively as low as when the cohort was in its thirties and reached a minimum inequality level in the range 0.15-0.2.

Insight N°3: Short-run intra-cohort income mobility is substantial at the beginning of the life-cycle and stabilizes at a low level when a cohort enters its forties; annual income is informative of working-life income only when the individuals are in the age range 35-55.

Because of income mobility, annual incomes are not uniformly associated with lifetime incomes. Cohort-specific income rank correlations between two consecutive years are merely around 0.7 when the cohort is in its twenties, indicating a significant amount of short-term mobility. When the cohort grows older, mobility becomes smaller and then remains stable until the cohort begins to retire. As a result, at the beginning of the life cycle annual incomes contain virtually no information about working-life incomes: their coefficient of correlation is close to zero! Then, this coefficient rapidly increases with age. We find that between the ages of 35 and 55 the correlation between annual and lifetime income reaches a maximum, typically between 0.8

²³ Measuring actual lifetime incomes after decisions on family formation requires the imputation of family information, since the social security data at hand do not systematically collect such information. In an ongoing research project, we extract family information from the German SOEP in order to impute a family context.

and 0.9. To a large extent this pattern is driven by heterogeneous labor-market dynamics across skill groups, in particular the fact that people with a higher educational attainment have a steeper age-earnings profile than those with a lower educational attainment. This has profound implications for the assessment of poverty.

Insight N°4: On average, about half of the members of a cohort who are income-poor from an annual perspective are not income-poor from a lifetime perspective.

Define intra-cohort poverty as the fact of belonging to the bottom decile of the cohort-specific distribution of incomes. Those who are working-life poor – i.e. belong to the bottom decile of the distribution of working-life incomes of their cohort – spend about half of their working life outside the bottom decile of the annual distributions of income of their cohort. Conversely, in those bottom deciles you typically find that about half of their members are not income-poor from a working-life perspective. Even those who belong to the top decile of the distribution of working-life incomes turn out to spend a non-negligible share of their working life in the bottom decile of the annual distributions of income of their cohort.

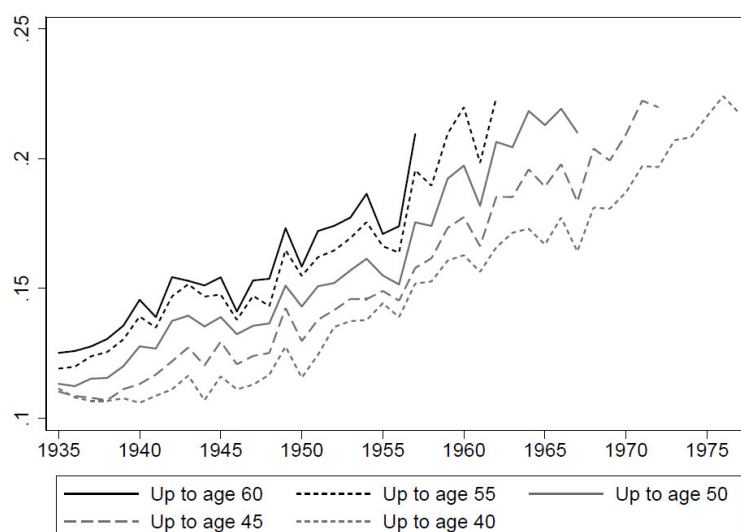
Our most surprising empirical finding concerns the long-run evolution of lifetime income inequality.

Insight N°5: Over time a huge increase of intra-cohort working-life income inequality has taken place in Germany.

Remember that working-life incomes were defined as the present values of incomes received from age 20 to age 60; our data allow us to determine such incomes for the cohorts born between 1935 and 1957. In order to get a firmer grasp on underlying trends, we exploit also income information about cohorts that have not yet completed their active life cycle. To do so, we employ the concept of *up-to-age-X income* (UAX): the present value of incomes received until some age X and discounted to the year when the individual turned 20. Thus, working-life income is a special case of UAX for $X = 60$.

The concept of up-to-age-X income lends itself to the following assessment. Suppose to trace out the evolution of inequality of the cohort-specific UAX distributions. If we find that younger cohorts display a higher Gini-coefficient for a given X, and this is true for every X, this would indicate that a secular trend of increasing working-life income inequality is underway. This is precisely what the data reveal, see Fig.1.

Figure 1. Gini coefficients of UAX for cohorts 1935-1977.



Source: FDZ-RV – VSKT2002, 2004-2012_Bönke, own calculations using weighted data.

The increase of intra-cohort lifetime inequality is amazing. As an example, consider two cohorts, the one born in 1935 and the cohort born in 1965, which may be seen as respectively statistical fathers and statistical sons. The Gini-coefficient of the UA-50 distribution for the fathers equals 11.3 %. The Gini-coefficient of the UA-50 distribution for the sons equals 21.2 %. This implies a rise of inequality by almost 90 %. This is a much bigger order of magnitude than the one suggested by studies of cross-sectional annual income inequality in Germany.²⁴ A similar pattern is found by Guvenen et al. (2017) for the United States.

3.4 Lifetime income inequality and differential mortality

The analysis so far has neglected the incomes individuals receive after they retire. There are at least two reasons why extending the analysis so as to cover the retirement period is a worthwhile undertaking. The first one is the goal of assessing the redistributive role of the government with respect to the life opportunities of individuals. A substantial share of the mandatory contributions that workers have to pay is devoted to social security; correspondingly, the only form of monetary transfers from the government that many workers receive is precisely pension income. Therefore, understanding the overall redistributive impact of the government requires that the retirement period be taken into account. The second reason is the desire to understand the role that differential mortality plays in shaping inequality, i.e. the fact that members of the same cohort die at different ages and that there exists a positive statistical correlation between working-life incomes and life expectancy.

Therefore, we have computed *expected complete lifetime incomes* for the cohorts born between 1935 and 1949, i.e. the cohorts that are by now fully retired and for which only future pensions – and not future earnings, a significantly more uncertain variable – must be predicted. Concerning our methodology, such an exercise requires two additional ingredients. First, the microsimulation model must be extended to the future by incorporating the implications of the existing relevant social and tax legislation in Germany so as to be able to compute future pension and social entitlements.²⁵ Second, survival functions must be econometrically estimated in order to compute the right-hand side of the intertemporal budget constraint (3). The estimated survival functions turn out to significantly differ across cohorts and across deciles of the cohort-specific distribution of working-life incomes. Younger cohorts live longer and, within each cohort, higher deciles live longer. By way of an example, the expected number of remaining years of life for a 60-years-old member of the top decile of the cohort born in 1949 is about 24; for a member of the bottom decile it is only about 18.

Insight N°6: Complete lifetime inequality is slightly larger than working-life inequality and exhibits a similar evolution across cohorts.

That is to say that the curve of the Gini coefficients that pertains to expected complete lifetimes nicely fits with the pattern displayed in Fig. 1 above: the path followed by the Gini coefficient of complete lifetime incomes follows rather closely, but at a higher level, the one displayed by the distribution of up-to-age-60 incomes. This suggests that the previously discussed finding of a secular increase of lifetime income inequality is indeed a very robust one: younger cohorts face severely more unequal opportunities of material well-being over entire lives than their statistical parents.

Once we have taken retirement incomes into account, we are in a position to assess the actual income redistribution that is generated by the entire tax-transfer-system over the entire lifetime of individuals.

Insight N°7: The lifetime tax-transfer-system is progressive and mechanically reduces intra-cohort lifetime income inequality by slightly more than 20 %.

²⁴ See e.g. Biewen et al. (2019) for a recent analysis of annual income inequality in Germany. This discrepancy underscores the importance of the age composition of the sample in determining the inequality of short-term measures of income. Cohort size rapidly increased in Germany between the birth years 1945 and 1964 and declined hereafter. A discussion of the possible drivers of the secular increase of lifetime earnings inequality in Germany is offered by Corneo (2015); see also Seckler (2019).

²⁵ We also adopt the official governmental predictions about future growth rates and interest rates.

By comparing post-fisc to pre-fisc lifetime incomes we can easily compute effective lifetime tax rates, i.e. the proportion of lifetime earnings that is paid to the government in form of taxes and contributions net of social transfers. Independently of the observed cohort, we find that the higher the decile, the higher such a tax rate, i.e. the overall tax-transfer-system is progressive. In a lifetime perspective, the government mechanically reduces the Gini coefficient of the income distribution of a cohort by more than a fifth. This is a smaller effect than the one that is typically extrapolated from cross-sectional data; but the tax-transfer-system turns out to produce first-order redistributive effects also in a lifetime perspective.²⁶

I now approach a final question: how does *differential mortality* affect the inequality of material well-being over people's lives?

At first glance, one may be tempted to answer this question by comparing the above findings about complete lifetime income inequality to a counterfactual in which all individuals of a cohort share a common survival function (hence a common life expectancy), independent of their decile in the distribution of working-life incomes and equal to the average survival function of their cohort. Since higher deciles live longer in the data, this counterfactual has the effect of decreasing the pension income of those higher deciles and increasing the retirement income received by the lower deciles. As it turns out, the implied reduction of complete lifetime income inequality is small: the Gini coefficient decreases by about only 4 %. Thus, a hypothetical homogenization of the mortality rates along the income distribution of a cohort would have an almost negligible impact on its lifetime income inequality.

However, this simple assessment of the role played by differential mortality is not entirely compelling. It namely fails to acknowledge that material well-being cannot be reduced to lifetime income in situations where you compare individuals that differ with respect to their longevity. A longer longevity generates additional well-being even with a fixed lifetime income because: (i) such an income can be spread over a larger number of periods, i.e. types of goods; (ii) there may be a direct effect on well-being just from being alive rather than dead. This means that the concept of lifetime income consistently summarizes the multidimensionality of consumption across time if the time endowment is uniform; but if longevity is an additional dimension of inequality, the concept of lifetime income delivers an incomplete and potentially biased description of the inequality of material well-being.

One can reformulate the distinction made above as one about the variable that should be used to compare life opportunities: resources or welfare. If one is interested in the disparities in access to material resources, lifetime income is the appropriate notion. If one is interested in the disparities in the access to welfare and if longevity is uniform, lifetime income is again appropriate because it delivers a common money-metric welfare representation. This ceases to be true if one is interested in the disparities in the access to welfare but the individuals to be compared exhibit differential longevity.

What is an appropriate measure of lifetime welfare for a set of individuals with different longevity? As shown by Becker et al. (2005), you can assess inequality in terms of a money-metric representation of lifetime welfare that is equal to the sum of one's lifetime income and one's willingness to pay to keep one's longevity rather than a reference one, i.e. the average of one's cohort. Clearly, this approach nests the lifetime income approach that is just the special case in which longevity is uniform and thus the willingness to pay is zero. In general, this approach additionally requires the quantification of that willingness to pay; for example, one has to quantify the maximal amount of expected lifetime income a member of the top decile of the cohort born in 1949 would be willing to give up in order to keep his survival function instead of switching to the average one in his cohort. This amount of money is his willingness to pay for his differential longevity and this amount must be added to his expected lifetime income to yield his expected lifetime welfare, expressed in units of money.

In the welfare perspective just sketched, a homogenization of mortality rates within a cohort has thus two effects on inequality: first, the one on received incomes that was already quantified above; second, the elimination of any (positive or negative) willingness to pay for differential longevity. The key empirical question is whether this second effect is quantitatively significant.

In order to compute the intra-cohort distributions of *lifetime welfare* we have built on the theoretical framework of Becker et al. (2005) and generalized it. We have retained their functional form for a common utility function and adopted the numerical parameter values they used. However, we have relaxed their

²⁶ This is in line with similar findings for Sweden exhibited by Bengtsson et al. (2016). However, that study follows a different methodology in that it pools together 21 birth-year cohorts observed during the period 1968-2009 and compares their lifetime real incomes with annual real incomes.

empirically untenable assumption that the interest rate is time-invariant and equal to the pure time preference. Once we apply our more general formula to our data, we find that lifetime inequality in terms of welfare is about 20 % larger than in terms of income. To sum up,

Insight N°8: Differential mortality has a small impact on the inequality of lifetime income but a large one on the inequality of lifetime welfare.

So, in contrast to the resource approach, a welfare approach suggests that differences in longevity are a crucial determinant of lifetime disparities in society.

Our finding must be qualified in at least two respects. First, and differently from the measurement of lifetime incomes, the current welfare analysis has required an explicit assumption about preferences, both their functional form and the numerical values of the parameters in the utility function. Since preferences cannot be (directly) observed, this creates an important source of uncertainty about the quantification of the effects. Hall and Jones (2007) adopted the same utility function as Becker et al. (2005) but proposed significantly different parameter values. If we use their parameter values, we find that lifetime welfare inequality is even larger and the effect from differential mortality is magnified. Second, the computation of the willingness to pay for differential longevity along the lines of Becker et al. (2005) posits that individuals have rational expectations and maximize their expected utility function over their entire life-cycle by trading in a complete set of perfect financial markets. As a robustness check, we have computed lifetime welfare in an opposite scenario, in which individuals have no access to capital markets whatsoever and thus consume in each year their annual disposable income (so called “hand-to-mouth assumption”). Reassuringly, our findings in terms of inequality of welfare in this scenario are similar to the ones for the standard neoclassical scenario.²⁷

3.5 Extensions of the lifetime approach

A lifetime perspective on inequality can reveal the existence of long-run inequality trends and structural forms of inequality that deeply affect our societies, ones that would remain unnoticed if you limited the attention to short-term income inequality. Worldwide, several national pension systems make use of longitudinal earnings data, often covering several generations, to determine pension rights. It would be useful to harmonize the existing administrative information from those countries and assemble it into an international database. That would enable researchers to draw cross-country comparisons and to detect worldwide trends of lifetime income inequality.

The lifetime approach is also useful because it helps us to better understand intergenerational income mobility by quantifying the life-cycle variation in the association between annual and lifetime income. These findings could be used to adjust intergenerational estimates so as to minimize attenuation bias from the use of simple income snapshots that is typically made by that literature. Importantly, this attenuation bias is not only due to classical measurement error but also to the life-cycle bias that is produced by the heterogeneous curvature of income profiles over age for individuals with different educational attainments.

One avenue in the lifetime approach that has not yet been satisfactorily explored concerns the analysis of the evolution of intra-cohort mobility. Such a mobility has some normative interest because it is related to the concept of equality of opportunity. Similarly to the analysis that led us to detect a long-run trend of increasing lifetime inequality by comparing adjacent cohorts, one may analyze the evolution of measures of intra-generational mobility over entire lifetimes and test for the existence of a correlation between inequality and mobility across cohorts. This would inform the researcher about possible tradeoffs between increased intra-cohort lifetime income inequality and intra-cohort income mobility.

A major goal of future research in this area will certainly be to combine data on lifetime incomes with data on received gifts and inheritances so as to arrive at a more comprehensive assessment of lifetime resources and their distribution. Furthermore, this type of analysis appears to be necessary in order to provide a solid

²⁷ A growing empirical literature has put forward that in financial matters individuals exhibit a conspicuous behavioral heterogeneity, with varying degrees of sophistication. Taking this heterogeneity into account is one of the tasks of future research in this area.

empirical foundation to the estimation of optimal inheritance taxes – a tool of policy intervention that is becoming increasingly interesting with respect not only to distributive issues but also fiscal goals.

Finally, the role of differential mortality for lifetime welfare highlighted by the lifetime approach naturally invites one to extend the literature on intergenerational mobility to mobility with respect to longevity and mobility with respect to a money-metric welfare representation that takes differential longevity into account.

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4 A multidimensional framework for measuring inequalities, their causes and policy options: the Multidimensional Inequality Framework – MIF (by Abigail McKnight²⁸)²⁹

4.1 Introduction

Economic inequality has increased in many countries since the 1970s and although increases have not been uniform and trends have varied between countries, a growing awareness of the potential detrimental impacts of inequality has led to a growing focus on inequality in many large and influential international organisations. For example, the International Monetary Fund, the World Economic Forum, the OECD, the European Commission, Oxfam, the World Bank and the United Nations. This includes organisations who had previously focused on tackling poverty, widening their remit to include inequality. This is consistent with evidence of a positive relationship between poverty and inequality which suggests that to tackle poverty, one also has to address inequality (Hills et al., 2019). Twin goals of inequality and poverty reduction have been set by the World Bank and the United Nations (UN) which extend beyond the poorest nations to include rich and middle-income countries. In part this growing emphasis was influenced by concerns about the role that rising economic inequality played in the lead up to the 2007/08 financial crisis and what is seen as an opportunity to ensure that the benefits from future growth will be shared more equally. Other important factors have been the growing evidence base that high economic inequality is harmful for growth (see, for example, Berg and Ostry, 2011 and McKnight, 2019 for a recent review of the literature on the relationship between poverty, inequality and growth) and that redistribution is not harmful for growth (Berg et al., 2018).

As more organisations became interested in inequality, our knowledge and understanding of trends, causes and consequences have grown but there continues to be a fairly narrow focus on economic inequality, education inequality and health inequality with most research looking at single dimensions. The choice of outcomes for which inequality is assessed is also somewhat arbitrary and is often more to do with the availability of data rather than theoretical consideration. From a quality of life perspective the concept we are interested in is inherently multidimensional.

A number of multidimensional social indicator frameworks are currently available. For example, the OECD Better Life Index, the European Pillar of Social Rights, the Human Development Index (HDI), the Sustainable Development Goals, the UK's Equality and Human Rights Equality Measurement Framework (EMF) and the World Economic Forum's Inclusive Development Index. But none of these are theoretically grounded frameworks designed to measure inequalities in well-being (although both the HDI and the EMF are theoretically grounded they are designed to measure equality rather than inequality).

The lack of a systematic framework to analyse and address inequalities in well-being led to a collaboration between academics at the London School of Economics and the School of Oriental and Africa Studies (SOAS), and practitioners at Oxfam to develop a multidimensional inequality framework. This collaboration led to a framework that had a strong theoretical foundation yet was pragmatic in design.

The Multidimensional Inequality Framework (MIF) is designed to measure inequality in individual well-being, reflecting the fact that our lives have many important dimensions: our health, our relationships, our ability to have influence, our knowledge, and many others. The MIF is theoretically grounded in Sen's capability approach. The capability approach provides a clear methodology for the assessment of well-being through examining differences in people's capabilities to live the kind of life they have reason to value, and one they would chose for themselves. It rejects an exclusive focus on income or subjective well-being.

²⁸ Centre for the Analysis of Social Exclusion, London School of Economics.

²⁹ In 2017 academics at the Centre for Analysis of Social Exclusion (CASE) at the London School of Economics (LSE) and the School of Oriental and African Studies (SOAS) joined forces with practitioners in Oxfam to develop a multidimensional approach to measuring and analysing inequality. This was made possible by an initial grant from the LSE's International Inequalities Institute's Atlantic Fellows in Social and Economic Equity Visiting Fellows Programme. A further grant from the LSE's Knowledge Exchange and Innovation fund provided resources to finalise the framework and to build a dedicated website and user guides. Funding from both of these sources is gratefully acknowledged. Participants at seminars at the LSE and in Barcelona, experts who responded to the consultation on the first draft of the MIF, and colleagues in Oxfam (particularly Lara Contreras at Oxfam Intermón), CASE (especially Tania Burchardt) and the III at the LSE (principally Rana Zincir-Celal) generously gave their time and expertise to aid the development of the MIF. The preparation of this paper was funded by the European Commission's Joint Research Centre. The development of the paper was informed by helpful feedback and discussion by participants at the Expert Workshop on "Multidimensional perspectives on inequality: conceptual and empirical challenges" held at JRC Ispra, 29 November 2019 and from additional input from members of the JRC organising team.

The design of the MIF is innovative, marking a departure from the majority of previous instantiations of Sen's capability approach which have tended to focus on capability-deprivation (differences in rates of deprivation between groups) rather than capability-inequality which encompasses advantage as well as disadvantage. The development of a capability-based inequality measurement framework is a natural extension to work already undertaken in this field, offering a ground-breaking approach to understanding and addressing multidimensional inequality.

In this paper we outline the background to the development of the Multidimensional Inequality Framework and the capability approach (Section 2), describe the structure of the MIF in terms of the life domains, sub-domains, inequality indicators and inequality measures (Section 3), drivers of inequalities and candidate policies to reduce inequalities (Section 4), before concluding remarks (Section 5).

4.2 MIF and the Capability Approach

The MIF is theoretically grounded in the Capability Approach (key references include: Sen, 1979; 1985; 1987; 1992; 1993; 1999). This approach was applied to measure and analyse inequalities in the capability of people to have a good quality of life (more detail on how the MIF is theoretically grounded can be found in McKnight et al., 2019 and McKnight and Loureiro (forthcoming)). The application of the theory help guide the choice of dimensions, or domains, to avoid an arbitrary selection.

Previous instantiations of the capability approach have tended to focus on 'capability-deprivation' (e.g., the Equality Measurement Framework) and horizontal inequality where inequality is measured as differences between groups (e.g. ethnic groups or gender) in terms of not meeting a minimum threshold (e.g. being a victim of violent crime). The innovation of the MIF is that it is designed to also capture 'capability-inequality' where inequality is conceptualised as vertical inequality picking up advantage as well as disadvantage. Another innovation is that it operationalises the concept that it is possible to have 'too much' as well as 'too little' (e.g. power and influence). The concept of 'too much' in the capability approach has most notably been explored by Ingrid Robeyns (Robeyns, 2017a; Robeyns, 2017b).

In practice what does 'theoretically grounded in the capability approach' mean in terms of the features of the MIF?

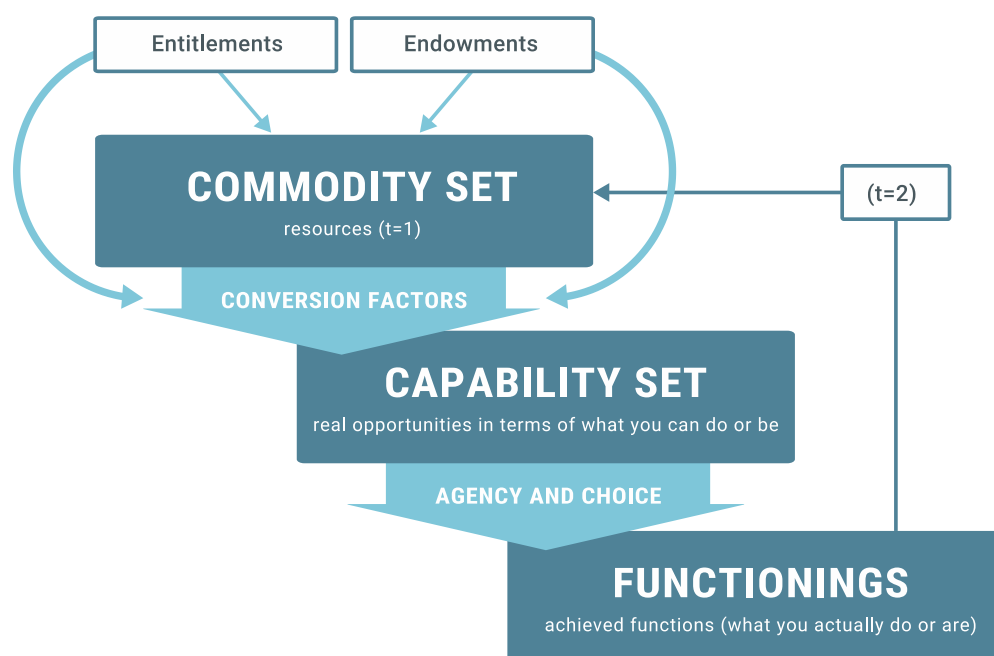
- 1) Capability approach theory is used to determine the overall structure – the choice of dimensions/life domains;
- 2) It shapes the structure within the domains in terms of the selection of sub-domains and inequality indicators;
- 3) It influences the choice of inequality measures by taking a capability perspective, incorporating aspects absent in frameworks which only consider outcomes:
 - Measures of horizontal and vertical inequality
 - Although typically measures capture 'functionings' (what people actually do or are), where possible the MIF includes measures aspects that affect real opportunities (constraints that affect freedoms and choice) in terms of what people can do or be (their capabilities);
- 4) Operationalisation of the concept of 'too much'
- 5) Includes measures which capture the treatment by others which can both enhance and limit capabilities – being treated with dignity and respect, facing discrimination or being negatively affected by social and cultural norms.

We cover the full set of capabilities, including those that could harm other. Some have argued that capabilities that harm others do not belong in the set but Sen rejects the notion that capabilities are by definition good capabilities, or only those that are not harmful to others (Sen, 2009). Burchardt and Hick (2018) also make the case that the capability approach can be used to look at the full spectrum of functionings/ capabilities.

The application of the capability approach doesn't stop at influencing the choice of life domains, sub-domains, inequality indicators and inequality measures within the MIF it is also drawn on to identify drivers of inequalities and inform policy. We draw on what we know about the building blocks of the capability approach to inform this work.

Figure 1 shows a stylized model which is informed by the series of equations that Amartya Sen set out in (Sen, 1985) to describe the relationship between the commodity set, capability set and achieved functionings. We extend this to consider both the dynamic and the inter-dimensional nature of capabilities formation.

Figure 1. Stylized model of the capability approach



Source: McKnight et al., (2019)

Individuals initial commodity set (resources) are influenced by entitlements which can be set in law or by norms and endowments which they may have inherited. The ability to convert resources/commodities into valuable things that they can do or be (capabilities) can be affected by a range of factors and conversion can occur at different rates. Sen suggests a number of conversion factors which are typically grouped into three main categories. Dang (2014) and Robeyns (2017) provide illustrative examples of conversion factors in each category. These are:

- (a) *personal conversion factors* (such as personal characteristics: physical and mental aspects (for example, disabilities), age and gender);
- (b) *social conversion factors* (such as social institutions, social norms (gender, religious, cultural, moral), traditions and the behaviour of others (sexism, homophobia, racism, etc.), and;
- (c) *environmental conversion factors* (including climate, pollution, deforestation, etc.). These factors influence the conversion rate from individual resources into functionings (outcome or achievement) and capabilities (real opportunities or positive freedoms) (Dang, 2014, p.462).

Examples of attempts to define and measure conversion factors and conversion rates in the literature can be found in: Chiappero-Martinetti and Salardi (2008); Comim, Qizilbash and Alkire (2001); Brandolini and D'Alessio (1998).

As set out in the stylized model in Figure 1, commodities/resources are converted into a capability set and this set contains the valuable things that people can do or be (substantive opportunities), such as being physically secure, being knowledgeable and participating in decision-making. What we tend to observe is 'functionings' what people actually do or are. Agency and choice play an important role in determining what people choose or achieve 'functionings' (actual outcomes). As mentioned above, we also extend the standard set of equations to consider both the dynamic and the inter-dimensional nature of capabilities formation. The dynamic aspect is illustrated in Figure 1 showing how functionings influence the commodity set in the next period. For example, people's current capability to enjoy good health is influenced by their previous

history of good health. What is not shown in Figure 1 is how capability formation is inter-dimensional. For example, how capabilities or functionings in one domain influence capabilities or functionings in another domain. For example, how the capability to be knowledgeable, to understand and reason affects the capability to be financially secure. Through thinking through these inter-dimensional influences it allows us to consider:

- **Spawning privileges** – privilege/top achievement in one domain/capability helps secure privileged position in another (political power giving access to legal security);
- **Corrosive disadvantage** – deprivation in one domain leads to deprivation in another (poor education contributing to poor health);
- **Fertile functionings/capabilities** – achievements in one domain fosters that in others (financial security leading to stable family life).

See Wolff and de Shalit (2007/2013) on corrosive disadvantage and fertile functionings. McKnight and Loureiro (forthcoming) on spawning privileges.

4.3 The MIF structure

The Multidimensional Inequality Framework is structured around seven key life domains³⁰. The final selection of domains was initially informed by the development of the Equality Measurement Framework, which is theoretically grounded in the capability approach, informed by international human rights standards and involved a deliberative exercise and (Burchardt and Vizard, 2011). The development of the MIF involved dedicated research considering how the capability approach could be applied to measuring capability-inequality, a consultation with academic and practitioner experts, the development of a prototype based on data for Spain and pilots applying the initial version in Guatemala and Spain conducted by Oxfam. The seven life domains and short descriptions, which form the domain sub-titles, which outline the capability inequalities covered by each domain can be found in Table 1. This section briefly describes each of these seven domains. These short descriptions are taken from the online version of the MIF (CASE, 2020).

4.3.1 Domains

Table 1. Domains of the Multidimensional Inequality Framework

Domain	Short title	Sub-title
Domain 1	Life and health	Inequality in the capability to be alive and to live a healthy life
Domain 2	Physical and legal security	Inequality in the capability to live in physical safety and legal security
Domain 3	Education and learning	Inequality in the capability to be knowledgeable, to understand and reason, and to have the skills to participate in society
Domain 4	Financial security and dignified work	Inequality in the capability to achieve financial independence and security, enjoy dignified and fair work, and recognition of unpaid work and care
Domain 5	Comfortable, independent and secure living conditions	Inequality in the capability to enjoy comfortable, independent and secure living conditions

³⁰ The 'capability list'.

Domain 6	Participation, influence and voice	Inequality in the capability to participate in decision-making, have a voice and influence
Domain 7	Individual, family and social life	Inequality in the capability to enjoy individual, family and social life, to express yourself and to have self-respect

Source: MIF online.

- **Domain 1 - *Life and health: Inequality in the capability to be alive and to live a healthy life.*** The life and health domain covers the capability to be alive, to enjoy longevity and to live a healthy life. Inequality measures pick-up differences in mortality risks which may result from differences in exposure to death, lifestyle factors and differences in medical treatment. Information on some causes of death which involve violations of human rights law are generally not recorded in official statistics, so guidance is given on the use of allegations data. The domain captures key health inequalities across physical and mental health outcomes including objective measures of health and individuals own subjective assessment of their health status.
- **Domain 2 - *Physical and legal security: Inequality in the capability to live in physical safety and legal security.*** People need to be physically safe and enjoy legally security to live the life they have reason to value. Domain 2 covers the key elements of physical security through indicators and measures that highlight absence of physical security (for example, the experience of violence) as well as subjective measures reporting individuals' sense of physical security and safety. People need to be protected and treated equally and fairly by the law in order avoid inequalities in legal security. This domain covers inequalities in treatment before the law and within criminal or administrative systems.
- **Domain 3 - *Education and learning: Inequality in the capability to be knowledgeable, to understand and reason, and to have the skills to participate in society.*** The capability to be knowledgeable, to understand and reason, and to have the skills to participate in society is a critical life domain. The capability to function as a knowledgeable learner is both important in its own right but also contributes to the expansion and equality of capabilities in other spheres of life. Domain 3 covers inequalities in education capabilities over the life-course, combining measures of low levels of educational attainment with measures of high attainment and unequal access to elite education opportunities. The domain also includes measures of critical thinking, awareness of rights and treatment within learning establishments.
- **Domain 4 - *Financial security and dignified work: Inequality in the capability to achieve financial independence and security, enjoy dignified and fair work, and recognition of unpaid work and care.*** The capability to be financially secure and enjoy financial independence is an important element of well-being. In addition, economic inequalities play a key role in shaping inequalities in other life domains. Measures include income and wealth inequality, rates of poverty and material deprivation, income insecurity and financial resilience, including measures designed to capture advantage as well as disadvantage. This domain also covers aspects of work; an important element of well-being not just because it provides an income but because workers can enjoy a range of non-pecuniary benefits. Inequalities include differences in working conditions and unequal access to the top jobs.
- **Domain 5 - *Comfortable, independent and secure living conditions: Inequality in the capability to enjoy comfortable, independent and secure living conditions.*** Inequalities in the capability to enjoy comfortable, independent and secure living conditions is assessed in this domain across a range of indicators and measures. These measures are designed to capture inequalities in the capability to meet basic needs (food, safe water, sanitation and shelter), access to good quality and secure housing, access transport infrastructure, the ability to live in environments that promote dignity and respect, the quality of the local environment (rubbish, pollution, noise, access to greens spaces, etc.), access to leisure facilities and the ability to enjoy leisure time alongside employment or caring responsibilities.
- **Domain 6 - *Participation, influence and voice: Inequality in the capability to participate in decision-making, have a voice and influence.*** The capability to participate in decision-making, have a voice and influence, affects political, social and family spheres of life. Different forms of

participation covered in this domain, include, participation in democratic processes (for example, national and local elections), the ability to join workplace associations and community action groups, as well as involvement in decision-making within the family. In terms of inequality, it is recognised that it is possible for some individuals to have 'too much' influence as well as 'too little'. The domain includes measures designed to capture evidence of political elites, political revolving doors and corruption.

- Domain 7 - *Individual, family and social life: Inequality in the capability to enjoy individual, family and social life, to express yourself and to have self-respect*: The capability to enjoy individual, family and social life, to express yourself, have self-respect, avoid loneliness and social isolation is fundamental for people to achieve a good quality of life. The freedom to develop as a person, form intimate relationships and to enjoy equality within these relationships are important aspects of individuals' personal lives. Measures include perceptions of freedom of choice and control over the way life turns out, ability to practice religion or beliefs without facing hostility. The domain includes inequality measures in relation to loneliness, self-confidence, self-respect and self-esteem.

Within each of these Domains, there are a selection of sub-domains, inequality indicators and inequality measures. The MIF results in a dashboard approach rather than a single index. In total, across the seven domains there are 42 sub-domains, 54 indicators and 187 measures. Detailed information about these can be found on the MIF publication (McKnight et al., 2019) or online (CASE, 2020). Here we provide a few illustrations to give a flavour of the structure and information available.

4.3.2 Sub-domains

Within each domain a number of key sub-domains have been identified. There number of sub-domains is not fixed and varies between domains. Taken from the CASE (2020), Figure 2 shows the six Sub-domains in Domain 6. One thing to note about the sub-domains is that some are specifically dedicated to covering top-end inequalities are there are denoted by the term 'Evidence' at the beginning of the title. Typically the inequalities covered within these sub-domains can be picking up harmful capabilities which have a negative impact on the capabilities of others. For example, sub-domain 6.B is "*Evidence of powerful elites with excess influence and control over decision-making processes in political life*".

Figure 2. Sub-domains in Domain 6

MIF Home The Framework (MIF) Domain 6: Participation, influence and voice

DOMAIN 6

Participation, influence and voice: Inequality in the capability to participate in decision-making, have a voice and influence

Print or share

Click on the button beside each sub-domain to see related indicators, inequality measures and references to any relevant UN Sustainable Development Goal (SDG) indicators. You may click on the Expand All button to view all inequality indicators, their measures and SDG indicators within each of the sub-domains.

Expand All

Sub-domains:

- + 6.A:** Participate in and have influence over democratic and other decision-making processes at any territorial level, and including indigenous, customary or community decision-making processes
- + 6.B:** Evidence of powerful elites with excess influence and control over decision-making processes in public and political life
- + 6.C:** Participate in decision-making and make decisions affecting your own life independently within your household and family
- + 6.D:** Participate in non-governmental organisations concerned with public, political and working life
- + 6.E:** Have freedom to form and join civil organisations, social movements and solidarity groups, including trade unions; freedom of assembly and association and enjoy active citizenship

Downloads

Download PDF for Domain 6

Useful Resources

Data

As well as using any national surveys and sources, consider the following to find data related to this domain:

- European Quality of Life Survey
- European Social Survey
- Sustainable Development Goal Indicators Global Database
- World Values Survey

Source: MIF online.

4.3.3 Indicators and measures

Within each sub-domain there are a number of inequality indicators and inequality measures. Where possible there is a mapping between MIF inequality measures and SDG indicators. An example for Domain 3 can be found in Figure 3.

Figure 3. Domain structure in Domain 3



Source: MIF online.

An online toolkit (CASE, 2020) provides information on how to apply the MIF, which breakdowns (disaggregation) are likely to be of interest, data sources and what to do about data gaps, how to analyse the output and write reports.

With 187 inequality measures and a number of potential breakdowns that users might be interested in, applying the whole MIF soon becomes a large exercise. It is important to be aware that the MIF is very flexible and users can choose to focus on a selection of domains or particular aspects of inequality (e.g. top-end inequalities) or specific breakdowns (e.g. gender). Different country context can help to determine this selection and the toolkit provides guidance on how to complete this process, a process we refer to as 'countrification', which could involve a deliberative exercise.

4.4 Inequality drivers and policy options

In the MIF toolkit we distinguish between country-level drivers of inequality, global and regional drivers of inequality, and candidate policies for each of the main driver categories.

4.4.1 Global and regional drivers of inequality

One of the criticisms of the capability approach is that the focus is too much on individuals and important higher level aspects can be missed (for example, climate change). In the MIF we have identified ten Global and Regional drivers of inequalities. For these drivers, one government's action alone may not successfully tackle the problems that are created. These drivers are listed below and more information can be found in the MIF toolkit:

1. Dominant narratives, and corresponding policies, that justify and perpetuate inequality
2. Values, norms, practices and structures that perpetuate discrimination and intolerance, especially discrimination against women
3. Financialisation, the power of capital and global elites
4. The rise and power of global corporations and the lack of effective regulation
5. Lack of financial transparency and ineffective global tax governance

6. Skewed structure of global trade
7. Climate change and environmental degradation
8. Conflict, global displacement and international migration policies
9. Skewed technological development, scientific progress and innovation
10. Lack of effective global governance

4.4.2 Country-level drivers of inequality

The identification of country-level drivers of multidimensional inequality is structured around the life domains of the MIF. All the resources for identifying country-level drivers of inequality are available in the online toolkit.

As mentioned earlier, one of the innovations of the MIF is how it draws on the capability approach theory to identify drivers of multidimensional inequality, drivers of advantage as well as disadvantage. We have identified conversion factors, particularly processes and structures, which can explain how a distribution of resources (commodities) – the commodity set – gives rise to inequalities in outcomes (functionings). Consideration is given to personal conversion factors (e.g. disabilities, age, gender), social conversion factors (e.g. social institutions, norms, traditions), and environmental conversion factors (e.g. climate, pollution, deforestation). The theory also guides us to consider agency and choice (see Figure 1) and lead us to consider drivers of inequality that constrain choice, whether constraint is due to social or cultural norms (for example, restricting choice in terms of who you marry and which occupations you can work in), the direct consequence of the behaviour of others or due to inadequate or ineffective institutions or services. As outlined above, another innovation of the MIF is that both dynamic and inter-dimensional drivers of inequality are taken into account. From a multidimensional perspective, the resources required to achieve some capabilities are not, at least in part, commodities, but rather themselves other capabilities and their past actualisation in terms of functions. This allows users to consider ‘spawning privileges’, ‘corrosive disadvantage’ and ‘fertile functionings’ – capabilities polarisation traps with some multidimensionally-deprived and others multidimensionally-privileged.

For each domain we have identified a number of main driver categories. Within each main driver category, there is a series of guiding questions to help the analysis of drivers and a number of indicators that could be used to monitor these drivers. As with the measurement framework, users should feel to adapt this resource to reflect findings on inequality, needs and country context.

4.4.3 Policy options

For each MIF domain, and within each main driver category a number of ‘candidate policies’ have been identified. We refer to these as ‘candidate policies’ as both drivers and effective policies are likely to vary across countries and different context. However, in the future we plan to identify a select number of ‘priority policies’.

4.5 Concluding remarks

The Multidimensional Inequality Framework has been designed to systematically measure, analyse and address inequalities in the quality of people’s lives. It is theoretically grounded in the capability approach and therefore is concerned with inequalities in the capability for individuals to live the kind of life they have reason to value, and one they would chose for themselves. This theoretical underpinning is used to guide the overall structure (the capability list) as well as the choice of inequality indicators and inequality measures.

The MIF has a number of innovations: it is concerned with capability-inequality and not only capability-deprivation; it captures vertical capability-inequality (advantage as well as disadvantage), and; operationalises the concepts of ‘too much’ as well as ‘too little’.

The online MIF toolkit provides resources designed to help users apply the MIF but also provides information on inequality drivers and candidate policies. The identification of drivers and policies is also informed by the capability approach. This is achieved through the operationalisation of conversion factors as drivers of

multidimensional inequality, in both static and dynamic frames, recognising that inequalities in one domain may be key drivers of inequalities in another domain. This allows users to consider what can be regarded as harmful capabilities and how virtuous and vicious circles that can arise from 'spawning privileges', 'corrosive disadvantage' and 'fertile functionings'.

The Multidimensional Inequality Framework is very flexible and can be easily adapted to suit different countries, context and different regions. The MIF has been piloted in Spain and Spanish data was used to build a prototype version of the framework during the development stage. It is well suited to being applied across European countries. It offers a theoretically grounded approach and is the only multidimensional framework which is theoretically grounded in the capability approach. The LSE team are currently working with a number of organisations and individuals who are applying the MIF in different parts of the world.

The Equality Measurement Framework (EMF) informed the early development stage of the MIF but was designed to measure equality rather than inequality. The EMF's theoretical grounding in the capability approach and the way in which it was informed by international human rights frameworks, meant that the set EMF life domains (capability list) was a helpful point of departure in the development of the MIF. However, the EMF was designed for equality monitoring of a legally protected set of characteristics (gender, ethnicity, etc.) and therefore the domains were not fully populated with measures and measures were not nested in the sub-domains. Due to the MIF's focus on capability-inequality, capturing vertical as well as horizontal inequalities, the final selection of domains and the inequality indicators and inequality measures vary significantly from the EMF. The Human Development Index (HDI) is also a pre-existing framework theoretically grounded in the capability approach but it was designed to monitor development progress and is a composite index summarising average outcomes over only three dimensions (health, education and income). In recent times statistics from an 'inequality-adjusted' version of the HDI have also been published (IHDI). Within each of the dimensions average outcomes are adjusted for inequality assessed within that dimension (for example, high education inequalities results in a lower score for education). This approach is helpful for recognising the negative influence of inequality but is not the same as a multidimensional inequality framework. In addition, we were interested in a framework which had the richness of a dashboard of inequality statistics rather than a composite single statistic. Our review of existing international social indicator frameworks found none which were designed to measure multidimensional capability-inequality.

There are advantages and disadvantages to a dashboard approach, like that proposed by the MIF, compared to a composite index. Although the composite index sacrifices a lot of detail and variation within dimensions, it produces a single statistic which can be compared across countries. The data dashboard approach allows us to recognise and examine the multidimensional nature of well-being and inequalities within and between dimensions but it is not so easy to compare one country with another and say categorically whether one is more unequal than another. From the MIF pilots we learned that the sheer scale of the MIF can be a bit daunting and this led us to provide more guidance in the toolkit on how to adapt the MIF to different context and user needs and to think about taking a staged approach. They also highlighted how it would be useful to have benchmarks for different inequality measures against which a country's inequality could be compared. For example, to be able to compare inequality in one country with a benchmark level for that region or, for example, for low-income countries. As the MIF is applied across more countries we hope to be able to make available benchmark estimates.

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5 Using Big Data to understand inequality in cities (by Esteban Moro³¹)

5.1 Introduction

Cities are the main ground in which our society and culture develop today and will develop in the future. Around 68% of the world population is projected to live in urban areas by 2050. Diversified communities and social cohesion are crucial for sustainable urban growth (Putnam, 2000). However, cities are becoming more unequal and segregated, two significant forces eroding the social fabric of our neighborhoods, institutions, companies, and society (Glaeser, 2009). Income and racial segregation have been shown to impact access to critical urban resources, such as housing, community facilities, health services, and clean environments.

As a consequence, inequality and its spatial outcome, segregation, are creating substantial differences in health, education, innovation, and economic growth outcomes even within the same urban area (Chetty, 2014, 2016). Top 1 percent income group live 10 to 15 years longer than their counterparts in the bottom 1 percent income group. Children with more exposure to distressed neighborhoods have worse educational outcomes (Chetty, 2016), and higher levels of segregation are associated with high homicide rates, slower economic growth, or less innovation over time. Rising economic inequality is one of the most critical problems world-wide, and combating inequality has moved to the forefront of the policy debate, the different agendas, and sustainable development goals for 2030.

Despite this, our current understanding of inequality and its relationship with other urban problems like mobility, gentrification, or even social participation is still based on census or survey information, which is updated infrequently, contains only coarse-grained information, and it is scattered across different agencies or institutions. More importantly, this census-centric approach assumes that people's behavior is described by their residence, a somewhat restrictive picture of how social interactions happen in cities (Wang, 2018). Most works on residential segregation assume that "you are where you sleep." However, increasing access to different and more efficient transportation modes, the new spatial organization of home-work-shopping urban areas, and more access to leisure time suggest that the areas covered by our activity spaces go beyond our residential neighborhoods. Even in an ideal "20-minute" city (where access to most services are within 20 minutes), the places where people meet and interact would be far away from their neighborhoods. Finally, those traditional ways of understanding cities are incapable of following the sudden changes our society is experiencing. Most census or surveys are collected every ten years, leaving us explaining what happened ten years ago rather than nowcasting or predicting how our cities are evolving.

All of this, while companies like Google or Uber have real-time access to how people move and interact in urban areas! Today we have the potential to produce high-resolution updates of how people purchase, get to school, move, get a job, or interact by leveraging new digital sources of information from mobile data, social media, WiFi networks, phone apps, and credit cards (Batty, 2016). Companies are using this wealth of data to micro-segment clients based on their demographic but also their behavioral traits. But cities are still using primary segments of census groups (residential areas, gender, age, unemployment) to map and intervene in problems such as inequality, gentrification, or transportation. In the last years, we have witnessed an enormous amount of activity in trying to use that plethora of scientific studies and projects focused on using these new digital data sources to estimate and abundance of demographic indicators. Satellite images and machine learning techniques are used to map poverty at high resolution (Jean, 2016), Facebook Ads are used to measure gender digital gap in the whole world (Garcia, 2018), or the analysis of social media posts allows us to understand the dynamics of unemployment (Llorente, 2015). These works show the potential of Big Data to complement official statistics, especially in situations where the spatial or temporal resolution of official statistics is not enough. Thus, cities are a particular instance in which Big Data can help most in policy-making. City halls are aware of this situation and have led to this change by creating open data portals, collaboration with companies, or Smart Cities initiatives. Those projects mainly focus on the efficient allocation of resources in problems like energy, pollution, or transportation, leaving behind societal issues like inequality, segregation, or gentrification.

The large-scale, high-resolution, longitudinal, and dynamic information from Big Data sources enables us to ask a much broader set of questions on human behaviors, which are not possible through traditional lab experiments and surveys. Yet, the increasing volume, complex structures, and dynamics of behavioral data, as well as the research questions on the complicated human interactions, stretches the limit of conventional

³¹ MIT Media Lab, Universidad Carlos III de Madrid.

methods. The emerging field of data-driven "Computational Social Science" is sparked by the massive amounts of digital records of human behaviors (Lazer, 2009). New technologies offer at least three advantages. First, the data provides much higher resolution information both at a temporal and spatial scale, including granular information about user behaviors and individuals connections. That resolution enables us to understand not only the "when" and "where", but more importantly the "why", i.e. the underlying mechanism for the human decision-making process and thus design interventions accordingly. Second, digital technologies enable us to have a more comprehensive picture of how a 'macro' social group performs, including human behaviors at a city scale for an extended period. Third, digital platforms capture information dynamically, enabling us to understand how society evolves. But new technologies also come with new problems. Most Big Data sources are messy and sometimes based on non-representative samples (Zagheni, 2015); different post-stratification techniques can be used to alleviate these problems. More importantly, most large databases are held by the private sector and are built on personal information from users or customers. Privacy considerations and sustainable accessibility to those large datasets are obstacles to its regular use by decision-makers in our cities. However, recent private-public alliances like "Data for Good" Initiatives show a growing interest and possibility to access and analyze non-traditional data through key partnerships and collaborations (see examples at <https://datacollaboratives.org/>).

5.2 Big Data and Inequality

Within those collaborations, different research groups have started to get a deeper understanding of the multidimensional nature of inequality and segregation in our cities. Using massive data sets of geolocalized mobile phone data calls or social media posts, different researchers have shown the intertwined nature of segregation and mobility in urban areas. For example, Wang et al. (Wang, 2018) and Dong et al. (Dong, 2019) found in the US and other countries, that even though residents of disadvantaged neighborhoods travel far and wide, they mostly visit poor or underprivileged communities and thus their relative isolation and segregation persist. Segregation in mobility is also seen at the level of gender or race. Using mobile phone data, Gauvin et al. (Gauvin, 2019) found that women's travel patterns are different than men's and that access and use of public transportation mediate this difference. Slim et al. (Slim, 2014) showed that ethnic segregation has even a temporal variation within the day due to the different mobility rhythms in the city of the different ethnic groups. Segregation does not only happen in the spatial domain, but also in the social-network domain. Social media and credit card data (Dong, 2019) and mobile phone calls (Xu, 2019) were used to show that income segregation has the same fingerprint in social media that the one found in mobility. Not only people move to areas that are similar in income, they even use social media or mobile phone calls to communicate with similar people, even if they are in the other part of the city. These findings challenge our common understanding of segregation and inequality in the city. Segregation is not only reflected in the economic or racial sorting within neighborhoods; it is encoded into our behavior as we move, interact, or even communicate with the rest of the city. However, most of the traditional policies to improve social integration are place-based, such as affordable housing and easy access to transportation. The initial results from Big Data show that those policies misalign with how people experience segregation and are not sufficient per se to achieve better integration in our cities.

Findings go beyond the present status quo of inequality in our cities. Given the temporal and spatial granularity of Big Data, it is possible to find how business displacement, gentrification, or policies impact segregation in our city. For example, it is possible to find the impact on the segregation of a single business, library, or restaurant when they open. Or when the city is affected by a major event like a natural disaster or disruption in the transportation network. In a recent study, Yabe et al. (Yabe, 2020) found that even evacuation and reentry (return) after a major natural disaster (hurricane Irma) are affected by economic inequality. Evacuees with higher income were more likely to evacuate from affected areas and reach safer locations, increasing the spatial income segregation of affected areas.

Other studies show the interrelation of other major forces in our cities and inequality. For example, a very recent study (Berkes, 2019) using patent data found that an increase of innovation in an urban area yields to more economic inequality because of the "sorting effect": innovative companies tend to cluster together. To reduce costs, highly paid, highly educated individuals working at those companies choose to live nearby. That causes low-income workers to be pushed away from the region. Further gentrification of the area because of new amenities (upscale grocery stores, gyms, coffee shops) amplifies property value increases and further pushes low-income individuals out.

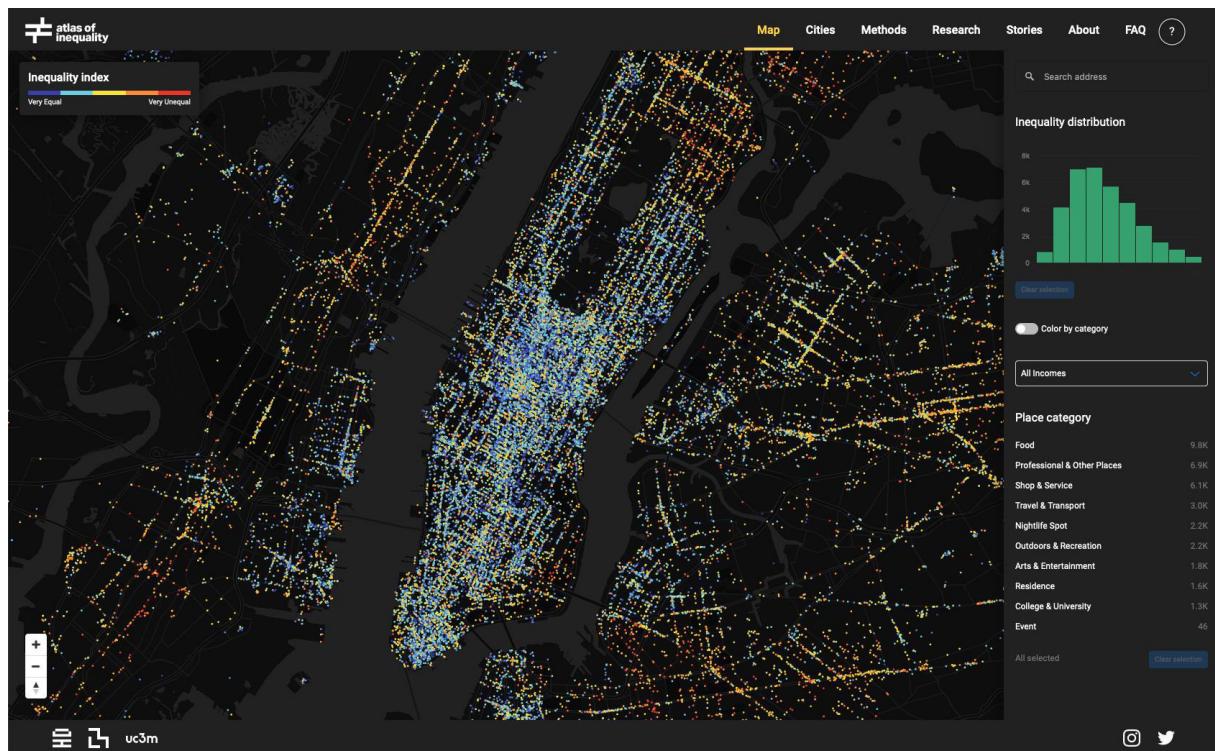
5.3 The Atlas of Inequality

Since segregation is encoded into our behavior, we need a better understanding of people's movements, choices, and opportunities to mix with other social classes. However, the spatial resolution of data from mobile phone calls or social media used in previous studies does not allow us to investigate which places, activities, or opportunities are the main drivers (or barriers) of social integration in our cities. Leveraging high-resolution data from mobile phone apps and other sources, several teams have started to look into the problem of inequality where it happens: places, not areas. For example, Athey et al. (Athey, 2019) found that, in the US, the (racial) isolation individuals experience by visiting places is substantially lower than standard residential isolation measures. Their results also corroborated that racial isolation happens closer to home and that individuals in cities are less segregated in public spaces like parks, retail establishments, and restaurants. Similar results were found by Beiró et al. (Beiro, 2018): malls are more diverse and that diversity has an effect on people's decision to go there. Finally, Davis et al. (Davis, 2018) using Yelp reviews found that restaurants are only about half as segregated as residences. All these works suggest that people's behavior greatly influences segregation or isolation. However, those studies lack the level of detail and extent needed to give a 360° of how segregation is affected by our behavior and the places we visit.

To understand better the spatial enablers and barriers of social mixing in our cities, researchers at MIT Media Lab and Universidad Carlos III de Madrid have built "The Atlas of Inequality" (<https://inequality.media.mit.edu/>), a interactive platform in which they analyze anonymized location data to understand how people move in urban spaces and how that movement influences or is influenced by income (Moro, 2019). To date, the Atlas has published maps of inequality in eleven metropolitan areas in the United States, and it is going to be extended to other countries like Mexico or Australia. The maps contain information about the income segregation of 1.1 million individual places (Points of interests) ranging from education venues to parks, restaurants or working places. Inequality of each place is calculated as how heterogeneous (in terms of income) are the people that visit that place. A place can be unequal if it is just visited by one income group and very integrated if all income groups in the city visit it. This methodology can be extended to other dimensions like race or ethnic groups. A snapshot of the platform can be found in Figure 1.

For this work, they anonymized billions of geolocated records of mobility data from the company Cuebiq who allowed their access through their "Data for Good Initiative." The data comes from Location-Based Services (LBS) smartphone applications (apps) and was aggregated for this project. This dataset consists of "pings," each identifying quite accurately the location of a given smartphone at a moment in time. Before its use, post-stratification sampling techniques (Salganik, 2017) and comparison with attendance to public events were used to check population and income representativeness. In fact, users in the database are only 3% richer than the average city dweller, which shows that the LBS data describes very well the mobility and behaviors of city dwellers. Census data was used to estimate the socioeconomic status of each smartphone using the median income of the area where they spent more time at night. Points of interest were obtained through the Foursquare open API, and visualization was made possible by CARTO, a spatial data visualization and analysis platform.

Figure 1. Snapshot of the "Atlas of Inequality" for the city of New York⁽¹⁾



- (1) The Atlas of inequality is an interactive platform where users can navigate the inequality in the city by place (restaurant, shop, park, etc.). The Highly integrated places, visited by many different income groups, are colored in blue, while highly segregated are colored in red.

Source: The 'Atlas of Inequality', by MIT & UC3M.

The platform shows two crucial new dimensions of segregation in our cities. The first one is that segregation happens even at the street level. Places located in the very same block can have a very different composition of visitors: mixed places can be only a few dozen meters away from those that are highly segregated, even just across the street. Where we get coffee, where we buy groceries, and where we grab take-out often reflect our choices, and in turn, determine the kinds of people we interact with every day. It's important to note that these choices that people make are usually constrained by things like affordability, location, and social groups. But as a result, socioeconomic inequality in exposure to other groups is encoded in part by these choices, not just where people live. The second important result is that the type of place matters for their segregation. Beyond the results of Athey et al. (Athey, 2019), in the Atlas of Inequality, we can see that some types of restaurants (fast food) are much more segregated than more healthy choices (e.g., vegetarian or Asian). Or that some workplaces like factories or warehouses are more segregated than offices or co-working spaces. Also, most cultural and entertainment places do not work towards integrating people: most of the museums, classical music or theaters are highly segregated, with the only exception of Science Museums which are also one of the most integrated places in all the cities studied. Still, the most segregated places in cities are schools and worship places. These results hold even if we controlled for the uneven distribution of different types of places in the cities.

The fine-grained structure of place segregation and the fact that individuals move much larger distances than home census areas challenge the notion that segregation in cities is driven by stationary locations (e.g., home, work, school environments). Official statistics show that the average person commute drives 40 miles per day in the US and 50 km in the EU. Thus, geographical accessibility within our neighborhoods to a particular type of place is not a limitation for a person to be segregated or not. To understand the reason why people experience segregation, in the second part of the project, the researchers at the Atlas of Inequality have analyzed the mobility patterns of 4.5 million people to study how their choices of places determine their segregation patterns. Results demonstrated that experienced inequality depends much more on where people spend their time than where they live or work. Specifically, around 45% of experienced inequality depends on the home neighborhood. In comparison, 55% of segregation is attributable to our lifestyles, i.e., the set of choices and opportunities we make when we move around the city and visit places.

This significant result shows that segregation is an emergent behavioral process that appears at the level of places, rather than a static attribute of regions or neighborhoods.

The visualization platform allows residents to test how their lifestyles impact their segregation and what other choices in the same areas are less segregated. In the specific case of the "Atlas of inequality," data visualization has the power to tell individual or area stories that raise public awareness about the segregation of social mobility in urban areas. Beyond this awareness, the findings in this research show potential paths to identify proper interventions to make public spaces, transportation, and community businesses more equitable. Although "place-based" interventions might still be relevant, interventions that help people change their lifestyles or behavior might translate into more significant effects in the segregation of people in urban areas.

5.4 Outlook

Thanks to the combined use of census and surveys together with Big Data sources, we understand today much better the multidimensional nature of inequality in our cities. Most of the inequality urban dwellers are experiencing is encoded in our lifestyles, i.e., the collection of choices and opportunities that we make every day as a result of our habits. And not where we live. Online (digital) and offline (spatial) behavior shows similar segregation patterns in our cities, and different socioeconomic groups have different preferences to visit different places or perform different activities. Cities are then the collection of unequal behaviors on top of unequal places. And not every place has the same segregation. Martin Luther King is still right, "(one of) the most segregated hours of (...) America is eleven o'clock on Sunday morning," but there are places in our cities that are more segregated like schools, workplaces or some services. Although the focus of policies to alleviate inequality in our cities has been mainly to intervene in those places, we probably have to move to the behavioral space to change segregation in our cities. However, individuals are increasingly using more algorithms to get better recommendations about places to visit, restaurants to eat, goods to be delivered, routes to navigate, or even jobs to apply. Hyper-personalization of those algorithms can unintentionally reinforce the income, racial or political bubble that we live in, creating more segregation in our cities. But those algorithms are also the perfect platform in which we can change people's behavior by recommending more integrated places or activities in the city. The interplay between algorithms, people's behavior, and policies is going to determine the future of inequality in our cities. And the use of Big Data is going to allow us to measure and probably predict it.

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6 The cultural dimension of inequality: what is the problem and how can we measure it? (by Dave O'Brien³²)

'Everyone has the right to freedom of expression. This right shall include freedom to hold opinions and to receive and impart information and ideas without interference by public authority and regardless of frontiers.'

'The arts and scientific research shall be free of constraint. Academic freedom shall be respected.'

'The Union shall respect cultural, religious and linguistic diversity.'

Charter of Fundamental Rights of the European Union

6.1 Introduction

Inequality in society is now an important concern for academic social science and public policy. Whilst there has been extensive discussion on the economic aspects of inequality (Piketty, 2014; Milanovic, 2018), recent trends have seen a more general concern with a broader range of dimensions (Atkinson, 2015; Piketty, 2018; Mijs 2019). This recent interest reflects the impact that social inequality has on limiting the capacity of citizens to flourish and realise their capabilities (Stiglitz et al., 2009). The cultural sphere is one example of this broader conception of inequality, sitting alongside, for example, health and wellbeing, education, and political rights and representation.

We can see a concern with the right to culture, and associated inequalities, in the Charter of Fundamental Rights of the European Union. Articles 11 (Freedom of expression and information), 13 (Freedom of the arts and sciences), and 22 (Cultural, religious and linguistic diversity) all demonstrate the importance of arts and culture to the rights of European citizens. The Charter is most centrally concerned with freedom of expressions, whether freedom from censorship or freedom for diverse cultural expressions across the member states.

The Charter's commitments can be read alongside the idea of cultural rights expressed in the Universal Declaration of Human Rights. Taken together, it is clear that a right to culture sits alongside other forms of freedoms that constitute how we might conceive a good, or just, society.

The right to cultural expression sits alongside the range of benefits culture has for citizens and societies. In addition to the principle of a right to culture, there are social and economic impacts which governments and the EU have sought to enable and encourage.

Yet, these rights, and these benefits, are shaped by inequality. We can see consequences of the relationship between culture and inequality in terms of how individuals do, or do not, benefit from culture.

American, Dutch, and British research has indicated the impact of having the right cultural resources to 'fit' professional occupations and elite institutions (Sullivan, 2001; Zimdars et al., 2009; Lareau, 2015; De Keere, 2019). Entry to these parts of economy and society is a story of 'hiring as cultural matching' (Rivera, 2012, 2015, Koppman, 2016). This means that those candidates that have the right types and styles of cultural consumption find the process of getting in and getting on in elite settings easier than their counterparts without this 'cultural capital' (Friedman and Laurison, 2019).

Engagement with culture has a range of benefits that go well beyond access to elite professions and institutions. Recent work on arts and health has attempted to isolate the wellbeing effects of culture (Daykin, 2019). Whilst the exact impacts are still subject to debate, it is clear that culture has important positive impacts for individuals and for communities, whether on health and wellbeing (Clift and Camic, 2016, Fancourt and Steptoe, 2019), or through more general contributions to community cohesion, urban regeneration, or educational impacts (Crossick and Kasynska, 2016), as well as cognitive, creative and relational skills (Fancourt et al., 2018). Inequalities here mean that the full range of benefits are restricted to particular social groups.

Access to the benefits of culture, whether in terms of employment or in terms of health, educational, and social benefits, sits alongside more directly negative consequences of inequality in culture. These are the

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social consequences of how specific groups, for example immigrant or poor communities, are represented (or not) on page, stage, and screen.

On this point the concern of various academic traditions, most notably drawn from media studies, along with drama and literature, is of how individuals and communities are represented when they are absent from the workforce for cultural industries (Skeggs and Wood, 2012; De Benedictis et al, 2017; Saha, 2018). There is a relationship, albeit not fully theorised, between the workforce producing film, television, theatre, and literature, and the audience they attract (e.g. Hesmondhalgh, 2018). More worrying is the potentially negative portrayals of specific groups that may be, at best, caricatures and stereotypes, or worse, for example characters or representations that are racist or sexist (De Benedictis et al, 2017; Saha, 2018).

We therefore need to understand the relationship between culture and inequality. However, there are issues when considering indicators on culture and inequality for cross-national comparative purposes. Moreover, there are complex questions as to where the choice of specific indicators, and associated data sources, fit within a broader suite of indicators for understanding levels of inequality.

In order to think through these issues, this paper moves in three stages. First, the paper considers what we know about 'cultural' forms of inequality. Second, having sufficiently demonstrated the existence and extent of inequality in access to cultural consumption and cultural production in national datasets, the paper then considers what we know at the cross-European level. Here, we can see that the sorts of inequality trends seen at national level are replicated in the Europe-wide data.

The means of understanding these 'cultural' inequalities suggest some important problems for the development of a cultural inequality indicator framework. With this point in mind, the paper closes with a third stage. This discusses recent trends in the study of cultural consumption. Here we can see how changing patterns of cultural taste in relation to social hierarchies, and discussions over the boundaries of 'art' and 'culture' in survey and associated research, create the need for more sophisticated research tools. This is a crucial issue if we are to bring culture into an inequality indicators framework, and thus deliver appropriate and effective policy responses.

6.2 Inequalities in cultural consumption and cultural production

What do we know about the relationship between culture and inequality? We can think about this relationship in two ways.

First, there are inequalities in access to cultural production. These inequalities are concerned with who is able to work in cultural industries, such as film and publishing. Access to cultural occupations sits alongside the associated social and aesthetic hierarchies assigning value and worth to specific forms of culture, rather than, other, everyday cultural activities.

This latter issue, of cultural hierarchies, is closely connected to the second way culture is related to inequality, via the range of inequalities we see in patterns of cultural consumption. Here the issue is three-fold.

There are range of inequalities in attendance, engagement, and participation in culture. These inequalities run along various demographic lines such as race, gender, age, levels of education, and social class.

There are, in turn, inequalities in what is seen as legitimate or 'high-brow' culture in contrast to popular or lowbrow cultural forms. These inequalities are dynamic, and the final section of this paper considers how they have changed over time.

There are also methodological issues, as the types of consumption inequalities and struggles over value and legitimacy are often embedded in the very survey tools that aim to uncover and make visible these inequality patterns. This point is further developed in the final section of this paper.

6.2.1 Inequality and cultural production

Access to cultural occupations is shaped by a variety of social inequalities. Two examples offer a useful overview of the (now extensive) literature (e.g. Conor et al, 2015; Banks, 2017; Gerber, 2017; Hesmondhalgh and Baker, 2011; Ramdarshan Bold, 2019; Scharff, 2018; Smith et al, 2019a, 2019b; Wreyford, 2018; Yuen 2016) analysing this problem. DuBois (2017) in a study of arts managers detailed the class and gender dynamics, interacting with education, of those at the start of their career. These dynamics produce a closed,

elite workforce that manages the arts in France, across Europe, and beyond. The demographics of the workforce, that are unrepresentative of most national populations in which the arts managers work, are also shaped by labour market conditions characterised by low pay and insecurity even though arts occupations have high social status.

The specific example of arts managers is mirrored in other cultural industries. Using British Labour Force Survey Data, O'Brien et al (2016) and Oakley et al (2017) found a range of inequalities associated with class, race, and gender in various cultural occupations including film, publishing, music and performing arts, and museums and galleries. Irrespective of whether culture is state funded, commercial, or a mixture of funding and business models, it is clear that who gets access to producing the culture associated with formal cultural institutions, and commercial cultural businesses, is shaped by inequality.

6.2.2 Inequality and cultural consumption

Formal cultural institutions, such as galleries and concert halls, along with cultural businesses such as film and television production companies or music venues, are important in understanding inequalities in cultural consumption. Who has access to the occupations making culture is a relatively recent concern in the literature. Who attends, who participates, and the overall patterns of taste in society has a much longer, and much more detailed research history.

The most well-known intervention on inequality and consumption is Bourdieu's (1984) *Distinction*. Here we can see the clear association between social position, as understood by occupation, and taste. Moreover, *Distinction* suggests that beyond the straightforward association between taste and social position, culture also reflects struggles for power and position. Much of this struggle occurs via the education system and is institutionalised in the audience demographics and social position of specific, elite, cultural institutions. Those at the top of the social hierarchy, the well-educated middle class, set the terms of both what counts as legitimate and illegitimate cultural taste.

Distinction focused on France, but subsequent research has seen similar analysis (and similar, if nuanced) findings all over Europe and the rest of the world (e.g. Bennett et al., 2009; Lena, 2019). Whilst there are extremely detailed and technical academic debates within the almost 50 years of post-*Distinction* literature, the connection between tastes (as measured by attendance at, participation in, knowledge of, and preferences for, a range of cultural forms), cultural hierarchies, and social inequalities are clear.

The *exact* nature of these relationships form much of the motivation for continued research, with demographic categories including gender, age, race, social class, social status, and levels of education all identified as important drivers of unequal engagement with formal cultural institutions and organisations, as well as drivers of the level, or volume, of that engagement (Brook, 2017; Bryson, 1996; Chan, 2010; Campbell et al., 2019; DiMaggio and Mukhtar, 2004; Hanquinet et al., 2019; Katz-Gerro and Sullivan, 2010; Kraaykamp and Dijkstra, 1999; Lizardo and Skiles, 2015; Meghji, 2019; Miles, and Leguina, 2017; Peterson and Kern, 1996; Reeves and DeVries, 2016; Taylor 2016).

6.3 What do we know about the cultural dimension of inequality at the European level

The literature surveyed here reflects national approaches. What about at the European level? Here there are three points. Cross-European (and to extent cross-national research in general) is much less common than national level work; what data there is suggests very similar trends to those seen within individual nations, albeit with the added benefit of the comparative perspective; and the choices of what data to collect in the survey instruments populating cross-European datasets have important consequences for how to understand culture and inequality within a general framework of cross-European indicators.

There are many ways of approaching cross-European work on culture and inequality. Recent examples include comparative studies of how culture is valued in European newspapers (Purhonen et al., 2018); bespoke survey work on values and attitudes of European citizens (Hanquinet and Savage, 2018); and comparative analysis of the 'cultural vibrancy' of European cities (Montalto et al., 2019). In addition, the rich wealth of individual national case studies suggest the possibility of productive, comparative work.

However, as Kirchberg and Kuchar (2014), and O'Hagan (2016) suggest, comparing national level surveys is fraught with difficulties. The issues include the purposes for which the data was collected, choice of variables, the wording and design of questions, alongside the differing national contexts for arts and culture. Bespoke work can offset these problems (although issues such as wording of questions remain a problem), but they are attached to specific projects with a specific timeframe. Repeated, if not exactly longitudinal, data is especially important at the cross-national level.

In the literature on cross-European comparative work, there are two sources of data that have been used to understand inequality and cultural consumption within the academic literature. These are the Eurobarometer and the EU's Statistics on Income and Living Conditions (EU-SILC) (see Annex 1 for a list of recent papers).

Eurobarometer data from 2013 has been used by Katz-Gerro (2017) to study cosmopolitan forms of cultural consumption, Lagaert and Roose (2018) to study gender and cultural participation, and Reeves (2019) to look at class identities and cultural consumption. 2007 data provided the basis for van Hek and Kraaykamp (2013) to explore the connection between levels of social mobility and inequalities in cultural consumption. Whilst each paper places a different emphasis in the analysis, the clear connection between social inequalities and patterns of consumption found at national level exists in cross-national research.

The EU-SILC have an ad hoc module on cultural consumption from 2006 and 2015. Eurostat uses the latter in combination with other surveys on time use, ICT use, and education to understand how cultural consumption is patterned in Europe ⁽³³⁾.

One example of the use of the 2006 data is Falk and Katz-Gerro's (2016) analysis of patterns of museum attendance. They found that even between nations (and thus between very different cultural policies) inequalities of attendance were clearly patterned. The impact of (higher levels of) education and (higher levels of) income on these patterns of attendance was also consistent, with education being the more important factor. Falk and Falk's (2011) analysis of attendance at live performances also found the consistent importance of education and income.

So, although comparative data and analysis at cross-European level is rarer than national studies, the relationships between culture and inequality seem to remain consistent.

6.4 Potential limitations of current approaches

The EU-SILC data on cultural consumption is seemingly a good starting point for comparative work on culture and inequality in Europe. Moreover, as analysis using the data has indicated, comparisons can be made beyond just the differing national levels of engagement in culture. Broader social inequalities can be brought into analysis, further reinforcing the usefulness of EU-SILC data as the basis for cultural statistics within a suite of inequality indicators.

The EU-SILC cultural participation module data is most likely to be used within a suite of indicators at cross-European level. However, both O'Hagan (2016) and more substantively Schmeets and Huynen (2010) raise several cross-national comparative problems about the 2006 SILC module on social and cultural participation, with concerns over the wording of questions and modes of data collection.

Beyond the specific concerns over the SILC, there are two more general notes of caution. The first is how we think about culture for the purposes of surveys and measurement. The second, related, issue is how patterns of elite consumption have changed over time.

The first section of this paper indicated a close connection between cultural consumption and a range of social inequalities. It noted how this connection extends to the very definition of arts and culture itself. In this context a range of scholars have questioned the appropriateness of using a limited range of survey questions to fully understand the relationship between culture and inequality (e.g. Bunting et al 2019).

The SILC's module on culture uses 5 'cultural' questions, and can be supplemented by questions on leisure and social activities. These ask about going to the cinema, to live performances, to cultural sites, to sport events, and about practicing artistic activity. Leisure and social activities include getting together with friends and family, and participation in leisure activity. They also give information on regularity of attendance and practice, along with data on the reasons for non-engagement, including costs, proximity, and lack of interest.

⁽³³⁾ See https://ec.europa.eu/eurostat/cache/metadata/en/cult_pcs_esms.htm for more details.

Whilst this is important information in the context of a large cross-European, survey, the SILC is a good example of the limitations of survey work in this area. This is for two reasons.

First, there is the question of whether attendance is sufficient to capture cultural activity. Attendance is changing as a result of new modes of digital practice, broadcasting and participation (NESTA, 2011), although patterns of inequality remain even within these new modes of access (Mihelj, 2019). More worrying, is that many forms of participation and engagement may occur outside or beyond attendance at formal institutions (Miles and Gibson, 2016, 2017). This is especially important in the context of cultural forms that are not institutionalised and may be associated with marginalised communities (Yudice, 2009). This links directly to the second problem.

Second, classifying individuals as excluded, or having an 'absence' of culture because they do not attend or engage in formal activities misunderstands the nature of the relationship between culture and inequality (Miles and Sullivan, 2012). The key axis of inequality is displayed in the institutionalisation of cultural hierarchies in survey methods. Attendance at the theatre is seen as culture. Painting in one's home, participation in a choir, reading for pleasure, are not (Bunting et al., 2019). Whilst the 2015 EU-SILC culture module captures some artistic participation activities, reading is covered by the Adult Education Survey. The debate about the boundaries of what 'counts' as culture is ongoing, and any use of the EU-SILC data should be attentive to the risks of potentially excluding culturally active citizens.

The problem of cultural hierarchy is related to the question of who decides what is culture, and what is not, given status and legitimacy in cultural hierarchies. As recent research has demonstrated, patterns of elite cultural consumption have changed over the past 40 years (Prieur and Savage, 2013; Hanquinet, 2017). The lines of demarcation between elite and popular culture, with the attendant social distinctions, have given way to new social cleavages grounded in new forms of cultural hierarchy.

Yet, the dominance of social elites and their ability to set the rules of the cultural field has remained, even as popular forms of culture have been given legitimacy alongside highbrow or traditionally elite practices and forms (Purhonen, 2018). What counts as culture is not only an ongoing and fluid subject; it is also, itself, the product of longstanding social inequalities. The risk here is that a narrow range of survey questions reinforces both cultural hierarchies and the new forms of distinction that have emerged as elites' taste practices change.

6.5 Conclusion: towards an indicator for cultural inequality

What can be done to understand culture and inequality across the EU? As the introduction to this paper suggested, the right to culture is an important element of how the Community is constituted. This is most clearly seen in the idea of the right to freedom of expression and freedom from censorship, alongside the right to diversity in expressions of cultural, religious, and linguistic practices. Here we might see an indicator that focuses on access to these rights as sufficient to capture cultural inequalities. However, this misses the more general relationship between culture and inequality beyond the, hugely important, framework of freedom of expression.

As the opening sections of the paper indicated, cultural production and cultural consumption reflect significant social inequalities. These inequalities are seen at both the national and the European level. However, we must be cautious about using the existing datasets as direct indicators within a broader suite of measures. Much more detailed and sophisticated metrics within the EU's SILC data, or an approach to reporting the data that very clearly sets out the limitations of the culture module within EU-SILC, are necessary.

The Commission is aware of this problem, and supported the European Statistical System Network on Culture which published recommendations in 2012. The ESSnet-Culture covered much of the ground discussed in this paper, and was especially attentive to definitional and cultural hierarchy issues, the changing social context, along with the impact of digital technology (Derooin, 2011). In 2015, KEA published a similar set of discussions, concluding with the need to build more capacity in data collection for culture, both in terms of cultural labour markets and patterns of cultural consumption.

In terms of the immediate aims for a suite of inequality indicators, it is appropriate to begin with the broad range of data Eurostat uses to understand patterns of cultural consumption and production across the EU, including the EU-SILC ad hoc module. However, as this paper has noted (and O'Hagan, 2016 discusses) cross-national differences in question wording, the potential exclusion of cultural practices that are either beyond

attendance at institutions or are not recognised as formally 'cultural', and the changing nature of legitimate culture and cultural hierarchies, may result in misleading information and inappropriate policy responses. Thus, if there is the opportunity, a more general expert exercise or seminar discussion on the question wording and alternative sources of data (KEA, 2015) would be fruitful to address these practical and methodological issues.

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Annexes

Annex 1. Key points from selected recent cross-European studies

Author	Paper title	Paper details	Key themes and ideas	Core dataset
Falk and Falk	An ordered probit model of live performance attendance for 24 EU countries	(2011) available from https://www.siecon.org/sites/siecon.org/files/oldfiles/uploads/2011/04/Falk-Falk1.pdf	Disposable income and education impact live performance attendance, and this is constant across nations. Other factors, including age, gender, and urbanisation/population density have an impact but vary between countries	EU-SILC 2006
Falk, M. and Katz-Gerro, T	Cultural participation in Europe: Can we identify common determinants?	(2016) Journal of Cultural Economics 40 127-162	Education and income shape museum, gallery, and heritage attendance, and are constant between countries. Other social characteristics, such as age and gender, vary in their impact across EU nations	EU-SILC 2006
van Hek and Kraaykamp	Cultural consumption across countries: A multi-level analysis of social inequality in highbrow culture in Europe	(2013) Poetics 41 323–341	Social inequality in highbrow cultural consumption is apparent all over Europe. Rates of social mobility across different European nations impacts cultural consumption, along with national wealth and levels of cultural offer. Wealthier countries see less pronounced educational and financial related consumption inequalities. Higher rates of social mobility reduce the impact of educational inequalities on consumption.	Eurobarometer 2007
Katz-Gerro	Cross-National Differences in the Consumption of Non-National Culture in Europe	(2017) Cultural Sociology Vol. 11(4) 438–467	This paper looked at cosmopolitan forms of consumption, such as reading books by an author from another country or going to a musical performance from another country. The analysis finds that very large proportions of the European population do not engage in 'cosmopolitan' cultural activities either in their own countries or in foreign countries, showing another dimension of consumption inequalities.	Eurobarometer 2013
Lagaert and Roose	Gender and highbrow cultural participation in Europe: The effect of societal gender equality and development	(2018) International Journal of Comparative Sociology Vol. 59(1) 44–68	The paper explores (and explains) the gender gap in consumption of 'high status' culture, as a society's gendered division of labour shapes both male and female rates of consumption. Gender gaps in consumption are smaller in nations where men engage more in care giving work and roles.	Eurobarometer 2013
Reeves	How class identities shape highbrow consumption: A cross-national analysis of 30 European countries and regions	(2019) Poetics 76	Looks at the relationship between self-identified class identity and cultural consumption. Whilst who identify as middle-class are more active 'highbrow' consumers, this varies across nations and by the numbers of citizens identified by working class in any given country.	Eurobarometer 2013

Source: Author's elaboration.

7 Measuring inequality of opportunity: a discussion of the recent literature (by Vito Peragine³⁴)

7.1 Introduction

The notion of “equal opportunities” has been of long-standing relevance in public debates and is increasingly proposed as a principle of social justice by politicians of different orientations. As an example, goal 10 of the United Nation’s Sustainable Development Goals (SDG) recognizes that “income inequality cannot be effectively tackled unless the underlying inequality of opportunities is addressed.” Alan Krueger, a former main economic advisor to President Obama, once said “The rise in inequality in the United States over the last three decades has reached the point that inequality in incomes is causing an unhealthy division in opportunities, and is a threat to our economic growth.”

Typically, the meaning of equality of opportunity remains vague in the public discourse, and this may partly explain its popularity. Though multiple definitions exist, the essence of the concept is that equality of opportunity obtains when everyone exerting the same degree of effort (or responsibility) attains the same level of advantage (or well-being), regardless of any predetermined circumstances beyond their control (Roemer, 1998). Outcome inequalities are therefore consistent with equal opportunities only to the extent that they derive from differences in factors individuals can be held responsible for.

There are different reasons for embracing the opportunity perspective. The first is that most of those who worry about inequality do so because they think that it is unjust, or at least partially unjust. In addition, existing surveys show that most people judge income inequalities arising from different levels of effort as less objectionable than those due to exogenous circumstances as gender, race, family origin, etc. The implicit idea is that what matters for a just society is the distribution of opportunities, rather than the distribution of outcomes. Hence, it is interesting to measure that portion of outcome inequality that can be attributed to exogenous circumstances and hence reflects unequal opportunities.

In addition to normative reasons, the analysis of opportunity inequality can have an instrumental value. First, social attitudes towards redistributive policies may be affected by the knowledge, or the perception, of the origin of income inequalities (Alesina and La Ferrara, 2005). By recognising that a small (large) amount of existing inequalities is due to unequal opportunities, one may decrease (increase) the support for redistributive policies. Second, opportunity inequality, rather than income inequality, can be related to aggregate economic performance: it has been suggested (Bourguignon et al. 2007 and World Bank, 2006) that the existence of strong and persistent inequalities in the initial opportunities open to individuals can generate true inequality traps that represent severe constraints to perspectives of future growth of an economy, by preventing entire groups from participation into economic and social life.³⁵

Finally, the analysis of opportunity inequality may help the understanding of the generation of income inequality, since it constitutes the layer hardest to remove through public intervention. Nevertheless, the knowledge of the factors determining opportunity inequality can help to identify the more deprived groups in a society, thereby revealing new points of emphasis in social and redistributive policies. These considerations are relevant for many countries and for the debate on social protection and social policies in Europe.³⁶

An economic literature addressing (in)equality of opportunity has grown from the early work by Roemer (1998), van de Gaer (1993) and Fleurbaey (1995). In its basic form, the equality of opportunity model is composed by a form of individual advantage (e.g. income, wealth, education, health), a set of inherited circumstances, which is assumed to be outside the sphere of individual responsibility (e.g. gender, race, nationality, family background), and a set (often treated as scalar) of responsibility factor. In this setting, the literature defines inequality of opportunity (IOp) as the part of overall outcome inequality attributable to differences in individual circumstances.

³⁴ University of Bari.

³⁵ For an empirical analysis of the relationship between inequality of opportunity and growth in a sample of US states see Marrero and Rodríguez (2013); they decompose total inequality into inequality of opportunity and inequality of effort, showing that GDP per capita growth rate is negatively correlated with the former and positively with the latter. A similar line of research has been followed by Ferreira et al. (2014), with a cross-country analysis involving a sample of 84 countries.

Several approaches to operationalize this definition have been proposed and applied in the last two decades to different dimensions of well-being, time periods, and countries: see Ferreira and Peragine, 2016, Roemer and Trannoy 2016, and Ramos and Van de Gaer for recent comprehensive reviews of the literature.

The diversity in methodological approaches and empirical applications has offered a variety of empirical evidence which, however, are hardly comparable among themselves: see Brunori et al. 2013 for a meta analysis of existing empirical applications and a discussion of the difficulties in cross countries comparisons.

Most of the literature, both theoretical and empirical, has been concerned with the analysis of inequality of opportunity in the case in which the outcome variable is unidimensional. Only very recently (see Kobus et al. 2020) some effort has been devoted to explore the consequences of the opportunity egalitarian approach for the evaluation of multidimensional distributions of individual outcomes.

The present paper is articulated as follows. In section 2, I will first present the canonical theoretical model of equality of opportunity (section 2.1) and an empirical model which has been extensively used in the literature (section 2.2). In Section 3 I will present some empirical evidences based on a recent dataset (the Equalchances.org database) which has been recently created in order to obtain consistent comparisons of IOp across countries and outcomes. Section 4 extends the discussion to a recent analysis devoted to the measurement of inequality of opportunity in a multidimensional setting, i.e., when the outcome is represented by a multidimensional variable. Section 5 concludes.

7.2 The equality of opportunity approach

7.2.1 The theoretical model

Consider a distribution of outcome x in a given population. Suppose that all determinants of x , including the different forms of luck, can be classified into either a set of circumstances C that lie beyond individual control, or as responsibility characteristics, summarized by a variable³⁷ e , denoting effort. Circumstances belong to a finite set Ω . For example, suppose that the only circumstance variables are race, which can only take values in the set {black, white}, and parental education, that only takes values in the set {college education, high school education}. In this case the set Ω would be the following: $\Omega = \{(\text{black, parents with high school education}), (\text{black, parents with college education}), (\text{white, parents with high school education}), (\text{white, parents with college education})\}$.

Effort may be treated as either a continuous or a discrete variable belonging to the set Θ . The outcome of interest is generated by a function $g : \Omega \times \Theta \rightarrow R$ such that:

$$x = g(C, e)$$

This can be seen as a reduced-form model in which outcomes are exclusively determined by circumstances and effort, such that all individuals having the same circumstances and the same effort obtain the same outcome. Neither opportunities themselves, nor the process by which some particular outcomes are chosen, are explicitly modelled in this framework. The idea is to infer the opportunities available to individuals by observing joint distributions of circumstances, effort and outcomes. Roughly speaking, the source of unfairness in this model is given by the effect that circumstance variables (which lie beyond individual responsibility) have on individual outcomes.

Thus, we have a population of individuals, each of whom is fully characterised by the triple (x, C, e) . For simplicity, treat effort e , as well as each element of the vector of circumstances, C , as discrete variables. Then this population can be partitioned in two ways: into types T_i , within which all individuals share the same circumstances, and into tranches T_j , within which everyone shares the same degree of effort. Denote by x_{ij} the outcome generated by circumstances C_i and effort e_j . Suppose in addition that there are n types,

³⁷ Effort could also be treated as a vector. However, we follow the literature and treat it as a scalar.

indexed by $i = 1, \dots, n$, and m tranches, indexed by $j = 1, \dots, m$. In this discrete setting³⁸, the population can be represented by a matrix $[x_{ij}]$ with n rows, corresponding to types, and m columns, corresponding to tranches:

Table 1. Distribution of outcomes according to circumstances and effort

	e_1	e_2	e_3	\dots	e_m
C_1	x_{11}	x_{12}	x_{13}	\dots	x_{1m}
C_2	x_{21}	x_{22}	x_{23}	\dots	x_{2m}
C_3	x_{31}	x_{32}	x_{33}	\dots	x_{3m}
\dots	\dots	\dots	\dots	\dots	\dots
C_n	x_{n1}	x_{n2}	x_{n3}	\dots	x_{nm}

Source: Author's elaboration.

To the $n \times m$ dimensional matrix $[x_{ij}]$ in Table 1, let there be associated a $n \times m$ dimensional matrix $[p_{ij}]$ where each element p_{ij} represents the proportion of total population with circumstances C_i and effort e_j .

Given this model, the measurement of inequality of opportunity can be thought of as a two-step procedure: first, the actual distribution $[x_{ij}]$ is transformed into a counterfactual distribution $[\tilde{x}_{ij}]$ that reflects only and fully the unfair inequality in $[x_{ij}]$, while all the fair inequality is removed. In the second step, a measure of inequality is applied to $[\tilde{x}_{ij}]$. The construction of the counterfactual distribution $[\tilde{x}_{ij}]$ should reflect the principle of equality of opportunity.

Within this framework, the opportunity egalitarian principle can be decomposed into two distinct and independent sub-principles: *the Reward Principle*, which is concerned with the apportion of outcome to effort and, in some of its formulations, requires to respect the outcome inequalities due to effort; and *the Compensation Principle*, according to which all outcome inequalities due to C are unfair and should be compensated by society. Any satisfactory measure of opportunity inequality should respect both the compensation and the reward principles.

The existing literature has developed two main versions of the compensation principle and two consequent approaches to the measurement of opportunity inequality, namely the ex-ante and the ex-post approach.

According to the ex-ante approach, there is equality of opportunity if the set of opportunities is the same for all individuals, regardless of their circumstances. Hence in the ex-ante version, the compensation principle is formulated with respect to individual opportunity sets: it requires reducing the inequality between opportunity sets (*ex-ante compensation*). In the model introduced above, a given row i , that is the outcome distribution of a given type, is interpreted as the opportunity set of all individuals with circumstances C_i . Hence the focus

³⁸ In an alternative formulation, that would treat effort as a continuous variable, $F_i(x)$ would denote the advantage distribution in type

i and q_i denote its population share. The overall distribution for the population as a whole would be $F(x) = \sum_{i=1}^n q_i F_i(x)$.

is on the rows of the matrix above: the counterfactual distribution should reflect the inequality between the rows.

On the other side, according to the ex-post approach, there is equality of opportunity if and only if all those who exert the same effort end up with the same outcome. The compensation principle, in the ex-post version, is thus defined with respect to individuals with the same effort but different outcomes: it requires reducing outcome inequality among the individuals with the same effort (*ex-post compensation*). This means that opportunity inequality within this approach is measured as inequality within the columns of the matrix. Hence, the corresponding counterfactual distribution should reflect the inequality within the columns.

As far as the *reward* principle is concerned, different versions of the principle have been proposed by the literature, expressing different attitudes with the respect to the outcome inequality observed among individuals endowed with the same circumstances: from utilitarian reward (Van de Gaer 1993, Fleurbaey 2008), which express perfect neutrality, to inequality averse reward (Ramos and Van de Gaer, 2016) which express aversion to inequality, to intermediate and agnostic positions (Peragine, 2003 and Fleurbaey and Peragine 2013).

Different measures, which are either consistent with the ex-ante or the ex-post approaches, and with different versions of reward, have been proposed in the literature (see Ferreira and Peragine (2015), Ramos and Van de Gaer (2015)): they express different and sometimes conflicting views on equality of opportunity and in fact the rankings they generate may be different.³⁹ In addition, their informational requirements are quite different: while for the ex-ante approach one needs to observe the individual outcome and the set of circumstances, for the ex-post approach a measure of individual effort is required. Therefore, in addition to normative considerations, the choice of the methodology to adopt should reflect also the data availability. As often the database do not contain a satisfactory measure of effort, most of empirical applications focus on the ex-ante approach.

A measure extensively used in the literature, which is based on ex ante compensation and utilitarian reward, is *Between-Types* inequality, which was proposed in its non parametric version by Peragine (2002) and Checchi and Peragine (2010). It relies on a counterfactual distribution $[\tilde{X}_{BT}]$, which is obtained by replacing each individual outcome x_{ij} by the average outcome of the type she belongs to (μ_i), abstracting from individual level of effort. This smoothing transformation is intended to remove all inequality within types. Formally:

Between-types counterfactual distribution $[\tilde{X}_{BT}]$: $\forall j \in \{1, \dots, m\}, \forall i \in \{1, \dots, n\}, \tilde{x}_{ij} = \mu_i = \frac{\sum_{j=1}^m p_{ij} x_{ij}}{\sum_{j=1}^m p_{ij}}.$

Table 2. Measuring between-types inequality ($n = m = 3$)

	e_1	e_2	e_3
C_1	μ_1	μ_1	μ_1
C_2	μ_2	μ_2	μ_2
C_3	μ_3	μ_3	μ_3

Source: Author's elaboration.

³⁹ See Fleurbaey and Peragine (2013) for a discussion of the clash between ex-ante and ex-post equality of opportunity.

It is immediate to notice that between-types inequality is consistent with the principle of utilitarian reward: the types of $[\tilde{X}_{BT}]$ are made up of replications of the same outcome, the mean, and therefore the artificial distribution does not reflect any inequality within type – the kind of inequality which is fair according to the reward principle, and thus should be cleansed in $[\tilde{X}_{ij}]$. It is also consistent with ex-ante compensation, as the inequality between types (evaluated as the inequality between the means of each type) is preserved. Once the smoothed distribution $[\tilde{X}_{BT}]$ is obtained, any inequality measure I applied to such distribution, $I(\tilde{X}_{BT})$ is to be interpreted as a measure of inequality of opportunity.

An alternative, ex-post measure, inspired by Roemer's (1993) and implemented by Checchi and Peragine (2010) and Aaberge et al (2011), is based on the *Within-Tranches* counterfactual distribution $[\tilde{X}_{WTR}]$, which is obtained by replacing each individual outcome x_{ij} in a given tranche with the ratio between such outcome and the average outcome of that tranche: $v_j = \sum_{i=1}^n p_{ij} x_{ij}$. This normalization procedure is intended to remove all inequalities between tranches and to leave unchanged the inequality within tranches. Formally:

Within-Tranches counterfactual ditribution $[\tilde{X}_{WTR}]$: For all $j \in \{1, \dots, m\}$ and for all $i \in \{1, \dots, n\}$, $\tilde{x}_{i,j} = g(c_i, e_j) / v_j$.

Table 3. Within tranches inequality (n=m=3)

	e1	e2	e3
C1	x_{11}/v_1	x_{12}/v_2	x_{13}/v_3
C2	x_{21}/v_1	x_{22}/v_2	x_{23}/v_3
C3	x_{31}/v_1	x_{32}/v_2	x_{33}/v_3

Source: Author's elaboration.

It is easy to see that Within-Tranches is consistent with ex-post compensation: each tranche is obtained simply by rescaling original outcomes by a constant $(1/v_j)$. Therefore $[\tilde{X}_{WTR}]$ accounts for all of the original (relative) inequality within tranches. On the other hand, compliance with the reward principle is not guaranteed, since Table 3 does in general contain inequality within types: for at least one i and a couple j, h , $\tilde{x}_{i,j} = g(c_i, e_j) / v_j \neq g(c_i, e_h) / v_h = \tilde{x}_{i,h}$.

Once the counterfactual distribution has been obtained, either in the ex ante or in the ex post versions, the specific inequality index $I(\cdot)$ does vary across different papers but most use either the Gini index or the the mean logarithmic deviation, following Checchi and Peragine (2010) and Ferreira and Gignoux (2011).

7.2.2 The empirical model

The ex-ante between-types measure $I(\tilde{x}_{BT})$ has been extensively applied by a number of authors.

All of these papers use a measure of economic well-being – mostly household per capita income, household per capita consumption, or individual labor earnings – as the advantage indicator. For this reason, Brunori et al. (2013) refer to the between-types measure of IOp in these studies as an index of Inequality of Economic Opportunity (IEO). In fact, two closely related versions of the index are often reported: the absolute or level

estimate of inequality of opportunity (IEO_L) is given simply by the inequality measure computed over \tilde{X}_{BT} , i.e. by $I(\tilde{X}_{BT})$. The ratio of IEO_L to overall inequality in the relevant advantage variable (e.g. household per capita income) yields the relative measure, IEO_R:

$$IEO_R = \frac{I(\tilde{X}_{BT})}{I(x)}$$

The partition of types varies across studies, ranging from six to 7,680 types (see Brunori et al. 2013). Because in some cases the data sets are not large enough to yield precise estimates of μ_i for all types, some authors compute IEO_L using a parametric approximation. After estimating the reduced-form regression of income on circumstances:

$$x = C\beta + \epsilon$$

and obtaining coefficient estimates $\hat{\beta}$, these authors use predicted incomes as a parametric approximation to the smoothed distribution:

$$I(\hat{x}_{BT}), \text{ where } \hat{x}_i = C_i\hat{\beta}$$

Parametric estimates are also presented either as levels (IEO_L) or ratios (IEO_R), analogously. This approach follows Ferreira and Gignoux (2011), which in turn draws on Bourguignon et al. (2007).

It is important to note that these empirical estimates of “between-types” IOp – whether estimated parametrically or non-parametrically – are, in each and every case, lower-bound estimates of inequality of opportunity. A formal proof of the lower-bound result is contained in Ferreira and Gignoux (2011), but the intuition is straightforward: The set of circumstances which is observed empirically – and used for partitioning the population into types – is a strict subset of the set of all circumstance variables that matter in reality. The existence of unobserved circumstances – virtually a certainty in all practical applications – guarantees that these estimates of IOp could only be higher if more circumstance variables were observed.

7.3 Recent empirical results: the Equalchances database

The Equalchances.org database, realized by the University of Bari and the World Bank, contains a recent and, as far as we know, unique collection of comparable measures of inequality of opportunity across a large set of countries. It is based on a harmonized survey datasets from a variety of sources (see the website for a description of the data); on the basis of these data, it provides estimates of different measures of inequality of opportunity in 46 countries and for different years. Moreover, it provides estimates of the intergenerational transmission of income and education for 26 and 148 countries, respectively. The full list of estimates by index and year is shown in website. The empirical evidence is organized in the publicly accessible database: “*equalchances.org*”. This online portal is designed to make the material readable by a large audience (e.g. scholars, students, policymakers, and media).⁴⁰

The empirical findings show a high level of variation in our measures of socioeconomic opportunity and mobility across regions of the world. The most consistent pattern is that life chances are more unequally distributed in low-income and emerging countries as compared to high-income countries. That is, people born with unfavourable economic circumstances in poorer region of the world do not only endure the disadvantage of being confined in the lower ranks of the global income distribution but are also less likely to move up the social ladder in their own local context. The analysis also shows that the degree of cross-sectional income inequality as well as the levels and progressivity of education spending and taxation can explain some of the variation in the distribution of economic opportunities across the globe.

Annex 1 reports for the countries in the database their level of absolute and relative inequality of opportunity. The third column shows that IOP_A is generally low in the northern European countries, with the lowest value of 0.029 reported in Iceland. On the contrary, absolute inequality of opportunity is very high in African countries and in most of South America. The worst level of IOP_A is that of South Africa, with an

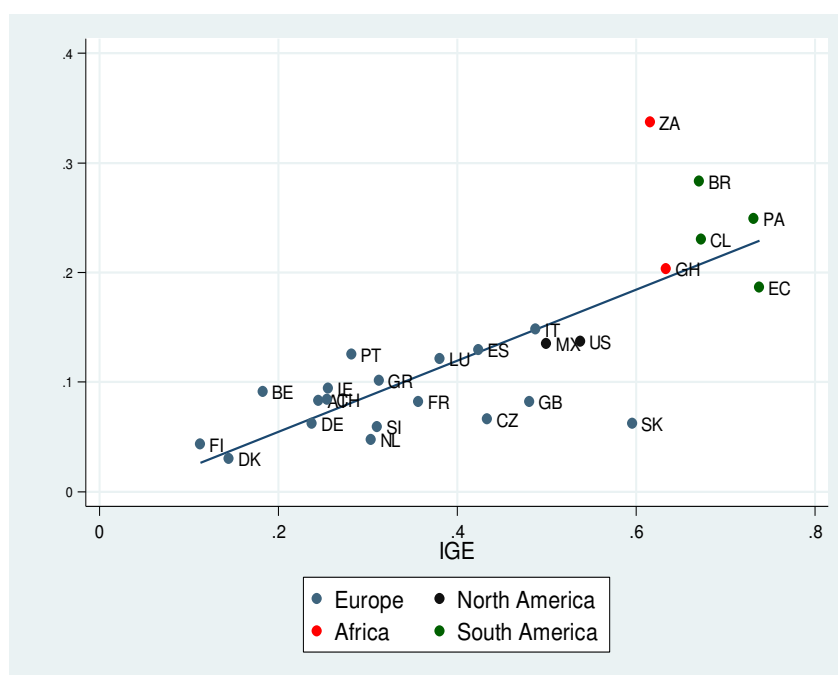
⁴⁰ The informative section also includes a range of data visualization tools and highlights patterns of association amongst variables of interest.

estimated value of 0.337. Amongst high-income countries, the United States and Italy are those with the highest levels of IOP_A with estimated values of 0.137 and 0.148 respectively.

An alternative way of comparing countries in terms of inequality of opportunity is to use the relative inequality of opportunity index (IOP_R), which is defined as the ratio between absolute inequality of opportunity and the total inequality in the distribution of the household equivalent disposable income. The second column in Annex 1 reports for all the countries in the database their estimated IOP_R . Although the absolute and relative IOP measures need not preserve the same ranking, the Nordic countries are again those with the lowest levels of inequality of opportunity, whilst African and Latin American countries occupy the top of the list (i.e. most unequal). IOP_R varies substantially, from 0.123 in Denmark to 0.584 in Guatemala. Amongst the high-income countries, Luxembourg and Italy have the highest estimated levels of IOP_R , presenting a value of 0.451 and 0.457 respectively. These are considerably higher than the IOP_R estimated for other European countries, with the exception of Bulgaria.

The database allows also to investigate the association between the absolute index of inequality of opportunity and the intergenerational persistence of income. Figure 1 shows a positive correlation between these two distinct measures of unequal chances. Considering the 26 countries for which both the IOP_A index and the IGE are available, the correlation coefficient is 0.77 (p-value: 0.000). The scatter plot in Fig. 1 allows us to group countries in three main aggregates: (i) a group of European countries with low- to mid-levels of IOP_A and IGE; (ii) the African and South American countries with high estimated values for both measures of unequal chances; and (iii) Italy, Mexico and the US in between these two groups.

Figure 1. Absolute inequality of opportunity and the intergenerational earnings elasticity

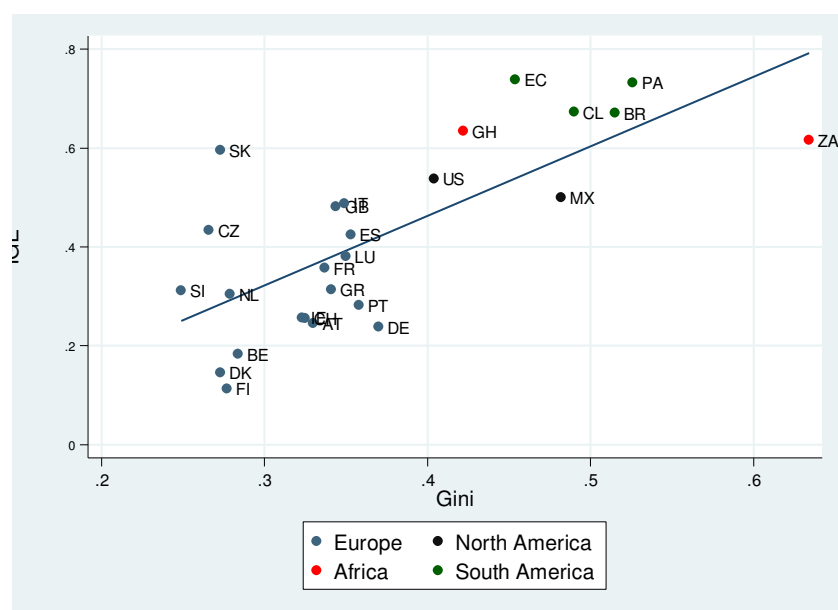


Source: The Equalchances.org database

A slightly lower correlation coefficient of 0.70 (p-value 0.000) can be found by considering the association between the *relative* index of inequality of opportunity and the intergenerational earnings elasticity.

It is also possible to plot both the IOP and IGE measures against overall income inequality as measured by the Gini index. This is similar to the popular “Great Gatsby curve” firstly introduced by Corak (2012) to describe the association between intergenerational mobility and overall income inequality. The “Great Gatsby curve”, here reported in Figure 2, has been re-estimated in a number of other studies (see for instance Brunori et al., 2013) using data from various sources and set of countries.

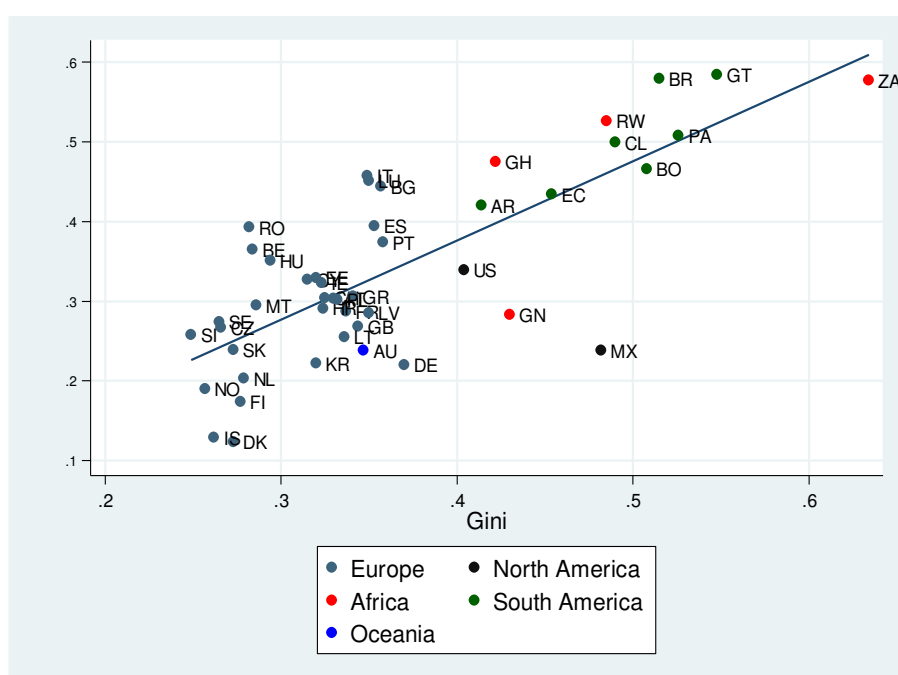
Figure 2. Intergenerational earnings elasticity over income inequality (Gini index)



Source: The Equalchances.org database

Using the equalchances database, Figure 3 also shows a positive and high correlation ($r = 0.763$) between IOP_R and the Gini index (on the basis of 46 countries). This is only slightly higher than the same coefficient obtained considering the correlation between the IGE and the Gini index (Figure 2) on a smaller set of countries, and confirms a positive association between the levels of cross-sectional inequality and the degree of 'unequal chances' as measured by the equality of opportunity approach. Hence, countries characterized by higher income inequality, show also a higher portion of inequality explained by circumstances, i.e., higher degree of inequality of opportunity.

Figure 3. Relative inequality of opportunity over income inequality (Gini index)



Source: The Equalchances.org database

7.4 Inequality of opportunity in a multidimensional setting

In both the theoretical and the empirical literature on equality of opportunity (briefly reviewed in the previous sections), the outcome of interest is typically represented by a unidimensional variable: income, consumption, education, health. On the other hand, both the theory and the practice of inequality measurement have moved towards the multidimensional space. For long, many researchers have advocated the inclusion of non-income dimensions in the evaluation of well-being (Sen 1973, Kolm 1977, Maasoumi 1986, Atkinson and Bourguignon 1982). Apparently, their call was heeded to: for instance, the United Nations now uses a multidimensional measure, the Human Development Index, to evaluate the well-being of nations and their progress over time. Several multidimensional measures of welfare and of inequality have been developed (Maasoumi 1986, Tsui 1995, 1999, Gajdos and Weymark 2005): these are measures based on joint distributions that are sensitive to multidimensional generalizations of the Pigou-Dalton Transfer (PDT) principles such as uniform PDT or uniform majorization (Tsui 1999), and to transfers that change the dependence structure, namely, so called correlation-increasing switches (Tsui 1999). Thus it is widely acknowledged in the literature and more so in practical decisionmaking that well-being is a multidimensional concept and cannot be reduced to a single proxy such as income. Therefore, if the goal of public policy is to seek equality of opportunity, its measurement has to account for the multidimensionality of well-being. To date, however, researchers on equality of opportunity have made only little progress on this mission. Some empirical works jointly investigate the presence of unequal opportunities for multiple outcomes, by treating those outcomes as separate identities. Examples include, Bourguignon et al. (2007) who analyze income and schooling outcomes in Brazil, Ferreira and Gignoux (2011) who focus on different income measures, or Peragine and Serlenga (2008) who analyze university graduation results and later life-income.

That is to say, the existing equality of opportunity literature has not addressed the multidimensionality of well-being in a satisfying manner.

In a recent paper, however, Kobus et al. (2020) develop a normative approach to the measurement of inequality of opportunity in a multidimensional setting, i.e., when the outcome of interest is a multidimensional variable. They focus on the ex ante approach, hence in their model within each type there is a multidimensional outcome distribution. Formally, types differ not only dimension by dimension, but also with respect to the dependence structure between dimensions. In other words, in a multidimensional setting, the effect of circumstances may not only be that worse types have worse distributions of outcomes, but also that individuals in worse types are more likely to be deprived jointly in several outcomes than in better types. The latter concerns dependence, which is a truly distinctive feature of multidimensionality. Kobus et al. (2020) adopt an axiomatic approach.

They first characterize three classes of social welfare functions, all endorsing ex ante compensation but each of them reflecting a specific reward principle: (1) utilitarian, (2) agnostic and (3) averse. These axioms use basic transformations that define the concepts of inequality. In a multidimensional setting, the defining inequality transformations are transformations that reduce spread in many dimensions (i.e., Pigou-Dalton Transfer on each dimension with potentially different amounts of attributes transferred) and transformations that change the dependence between dimensions (i.e., correlation increasing or decreasing switches — see e.g. Tsui 1999). Different reward principles reflect different sensitivity to such transformations when they happen within a type: in particular, a welfare function which respects utilitarian reward does not change, since it does not pay attention to any inequality within type; a welfare function which is agnostic is silent and the one which respects averse reward goes up. Then they link these classes to implementable criteria (i.e., different versions of Lorenz Dominance). The first class is implemented via generalized Lorenz Dominance applied to each attribute separately. The agnostic and inequality averse classes are implemented by a welfarist Lorenz ordering, namely, of type-aggregate utilities. In the case of inequality-averse class, utility functions are submodular, hence capturing the dependence between attributes. Finally, they construct inequality of opportunity measures that are induced by these three classes via the so called AKS transformation (Atkinson, 1970; Kolm 1969; Sen, 1973).

Finally, Kobus et al. (2020) propose an empirical application based on the National Longitudinal Study of Adolescent to Adult Health (Add Health) in the US, Waves 1-4. They use self-reported personal earnings, years of education and BMI as outcomes and a set of circumstance variables. Aversion to within-type inequality matters significantly in the evaluation of IOp. It constitutes more than half of overall IOp. The results show how considering the dimensions jointly as opposed to considering them separately changes significantly the evaluation of IOp. For example, univariate IOp for education and BMI are, respectively, .06 and .021, whereas for income it is .47. In such a case, IOp when outcomes are considered jointly equals .2. This comes from the fact that joint evaluation takes into account that (i) some outcomes are distributed

more equally than other, (ii) rankings of types with respect to mean outcomes values differ across outcomes (i.e. best income type is not necessarily best BMI type), (iii) within type, individuals occupy different positions on respective dimensions (i.e. highly educated individuals are not necessarily individuals with highest incomes). These are all factors that are missing when the focus is limited to a single well-being outcome such as income.

7.5 Concluding remarks

The equality of opportunity literature has made important advances in the last twenty five years, since the pioneering works of Roemer, Van de Gaer and Fleurbaey. Ideas first developed by philosophers such as Arneson, Dworkin and Cohen, and by economists such as Sen, have been translated into simple, coherent and powerful economic models by a number of economists since the 1990s, and a growing number of empirical applications have been proposed, with different methodologies and in different spheres of social life.

The existing methodological literature offers a solid guide for the estimation of inequality of opportunity in a number of different settings and socially relevant situations.

The equality of opportunity perspective can be used in distributional analysis to monitor social progress, as well as to evaluate the welfare effects of policy interventions in different areas. Combined with more standard approaches in welfare economics, such as the outcome based approaches to the evaluation of social inequities, it can help to identify emerging social needs and to set the priorities of redistributive policies.

From the methodological viewpoint, while some important achievements have been reached and some consensus has started to emerge among specialists and practitioners, it is also true that the equality of opportunity literature is still young. A number of issues still need to be settled, which involve: (i) problems of comparability across time and space of inequality of opportunity estimates; (ii) robustness of IOp estimates to different methodological choices; (iii) potential extension of methods originally proposed for the measurement of inequality of opportunity for income, to alternative outcome spaces (e.g. ordinal, multidimensional, etc.).

These are (some of the) challenges for the future works attempting at including a concern for responsibility and opportunities into the tools typically used to make normative evaluations and welfare comparisons.

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Annexes

Annex 1. Estimates of IOP_R and IOP_A in 46 countries (most recent year available)

<i>Country</i>	<i>IOP_{rel}</i>	<i>IOP_{abs}</i>
Argentina	0,4199	0,1585
Austria	0,3025	0,0829
Australia	0,194	0,06
Belgium	0,365	0,0914
Bulgaria	0,4444	0,146
Bolivia	0,4663	0,2219
Brazil	0,579439	0,282572
Switzerland	0,3037	0,0837
Chile	0,499432	0,23039
Cyprus	0,3273	0,0901
Czech Republic	0,2673	0,0662
Germany	0,2203	0,0615
Denmark	0,1233	0,0302
Ecuador	0,434436	0,186385
Estonia	0,3288	0,1063
Spain	0,394	0,1291
Finland	0,1738	0,0427
France	0,2866	0,0823
United Kingdom	0,2675	0,0819
Ghana	0,475	0,2031
Guinea	0,2825	0,111
Greece	0,3061	0,1013
Guatemala	0,583661	0,303284
Croatia	0,2913	0,0896
Hungary	0,3511	0,0962
Ireland	0,3234	0,094
Iceland	0,1294	0,0286

<i>Country</i>	<i>IOP_rel</i>	<i>IOP_abs</i>
Italy	0,4574	0,1481
Korea	0,2209	0,0688
Lithuania	0,2552	0,0874
Luxembourg	0,4507	0,1207
Latvia	0,2852	0,1022
Malta	0,2954	0,0815
Mexico	0,23802	0,135203
Netherlands	0,2033	0,0472
Norway	0,1896	0,0392
Panama	0,508422	0,249142
Poland	0,3021	0,0926
Portugal	0,3744	0,125
Romania	0,3928	0,131
Rwanda	0,5256	0,2684
Sweden	0,2738	0,0593
Slovenia	0,2576	0,0591
Slovak Republic	0,2393	0,062
United States	0,3393	0,1371
South Africa	0,5766	0,337

Source: The Equalchances.org database

8 The study of intergenerational mobility using rich administrative data (by Jan Stuhler⁴¹)

8.1 Introduction

Inequality has become an important topic in the social sciences, a fundamental dimension of which is its *intergenerational* persistence across generations. Socioeconomic success correlates within families, with children from well-off families being more likely to achieve high levels of education, occupational status or earnings than children from disadvantaged backgrounds. Concerns about cross-sectional inequality and intergenerational persistence are interrelated. For example, the observation that income inequality has been increasing in developed countries and labour markets are polarising (Acemoglu and Autor 2011) is of particular concern if the adverse consequences are concentrated and entrenched among certain families.

This report reviews two distinct, but related, strands of the literature on (i) the study of intergenerational mobility using *administrative* data sources and (ii) how *macroeconomic* shocks affect intergenerational mobility.

Section 2 reviews recent developments in the study of intergenerational mobility using administrative microdata. The increased availability and large scale of administrative sources have enabled novel research designs that in turn led to new insights. This section focuses on two such designs: the *area approach* and the *dynastic* or *extended-kin* approach. The former has contributed to our understanding of how regional characteristics affect intergenerational mobility, while the latter is changing our understanding of how entrenched socioeconomic inequalities are within a population, and the extent to which assortative processes contribute to intergenerational persistence.

Section 3 turns to recent evidence on how major economic shocks, such as an economic downturn or recession, affect intergenerational mobility. It also reviews a number of methodological issues that complicate the identification of the impact of economic events on intergenerational processes. Surprisingly, little evidence is available on the intergenerational consequences of the recent financial crisis. Studies on other types of economic shocks tend to be based on the area approach and large-scale administrative data. The different strands of the literature reviewed in this report are thus interrelated.

The increasing importance of administrative microdata relates to broader trends in causal analysis within the social sciences. Until fairly recently, most empirical research was based on a ‘selection on observables’ strategy in which researchers relate an outcome of interest to a variable of interest (e.g., a policy or institutional characteristic) and a number of control variables. While issues related to selection and endogeneity were acknowledged, researchers hoped that including a (potentially broad) set of control variables would address such issues and allow to infer causal relations (e.g., Leamer 1985). In contrast, studies today tend to exploit more specific sources of variation related to the timing of events (e.g., using a difference-in-differences or panel design), specific institutional thresholds (e.g., in a regression discontinuity design) or other discontinuities inherent to an institutionalised world.

In short, researchers have become more selective about which source of variation to use to provide evidence on causal relationships. The chances that the required data points happen to be included in a survey are typically small. With administrative microdata, researchers can observe a large share or the entire population, and can therefore isolate a specific source of variation apt for a strong research design. Many studies not reviewed in this report require administrative data for this very reason. For example, Dahl et al. (2014) match social security registers with court records to demonstrate that Norway’s disability insurance system has important spillover effects on the next generation. Kaufmann et al. (2015) match administrative records on university applicants with marriage registry data in Chile to show that university admission has important effects on partner selection and on the transmission of human capital. Many other studies have used administrative data to evaluate the intergenerational consequences of other policies and institutions.

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8.2 The study of intergenerational mobility using administrative data

Administrative data sources have enabled a number of distinct research designs that provide novel insights on intergenerational processes and its determinants. The aim here is to review several strands of this literature with respect to two questions: First, what has been the main promise of these different research designs, and how have administrative sources enabled or enhanced these designs? Second, what insights have been gained from these research designs or may be gained in the future?

8.2.1 The area approach

One way to leverage the size of administrative registers is to distinguish and compare individuals in different *areas*. An early example of the usefulness of this “*area approach*” is a study by Pekkarinen et al. (2009), who assess whether a comprehensive school reform that postponed the separation of students into vocational and academic tracks had an effect on the *intergenerational elasticity of income*.⁴² To answer this question, they exploit the staggered adoption of the reform across municipalities. Their empirical strategy consists of a two-step process: first, estimate the intergenerational elasticity for each municipality and year, and second, use those coefficients as the dependent variable in a difference-in-differences design. Their results show that the reform decreased the intergenerational income elasticity by more than 20%. Various other studies have used similar research designs in other settings and countries, providing hard evidence on what is an important and often controversial policy question: if the way school systems are structured can hinder or boost mobility. Crucially, these studies go beyond correlational analysis and provide evidence on the *causa* effect of schools and educational systems on intergenerational mobility.

The *area approach* has become very popular following the work of Chetty et al. (2014) on regional differences in intergenerational mobility in the United States, which employs the approach in a different fashion. While the estimation of area-level statistics in Pekkarinen et al. is motivated by the spatial properties of a particular reform (i.e., its staggered adoption across municipalities), Chetty et al. compute such area-level statistics as a means in itself, to systematically assess how different types of local characteristics correlate with intergenerational mobility. Thus, rather than providing causal evidence on a particular policy, their approach is valuable in an exploratory sense, showing which local characteristics are most closely associated with a lack of upward intergenerational mobility. More specifically, they show that high-mobility areas have less residential segregation, less income inequality, better primary schools, greater social capital and greater family stability.⁴³

Similar research designs have been applied in a number of other studies, such as Connolly et al. (2019a), Connolly et al. (2019b) and Corak (2020) for Canada, Deutscher and Mazumder (2019) for Australia, Heidrich (2017) and Brandén (2019) for Sweden, Risa (2019) and Bütikofer et al. (2018) for Norway, Eriksen and Munk (2020) for Denmark, Acciari et al. (2016) for Italy and Bell et al. (2018) for the United Kingdom. Figure 1 provides an illustration from Bütikofer et al. (2018), plotting the probability of reaching the top quintile when fathers were in the lowest quintile across regions in Norway, for a cohort of men born in 1952–1957. Access to large-scale administrative sources is the key requirement for this approach, as it requires researchers to observe sufficiently many parent-child pairs in each region.⁴⁴ A common theme in these studies is the relation between cross-sectional inequality and intergenerational mobility. Consistent with Chetty et al. (2014) and earlier cross-country comparisons (e.g., Blanden 2011), most studies find that high levels of income inequality in a region are associated with low levels of intergenerational mobility. Some studies find that areas with a large manufacturing sector tend to have higher upward intergenerational mobility. This observation is worrisome in so far that manufacturing and other types of “routine” jobs are declining in many countries (e.g., Acemoglu and Autor 2011). Indeed, in the

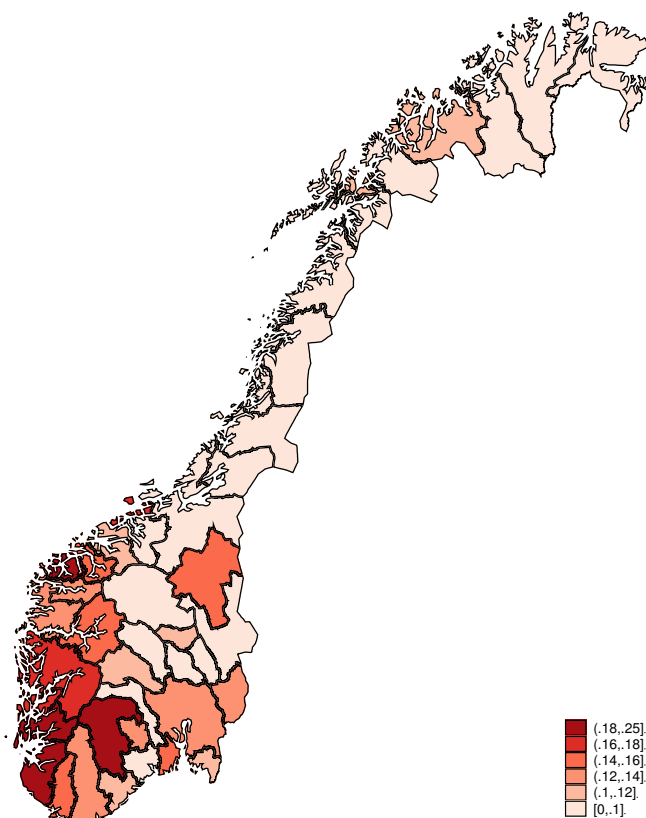
⁴² The intergenerational elasticity of income is defined as the slope coefficient in a regression of log child income on log parental income. It measures the extent to which income advantages in the parent generation tend to persist among their children.

⁴³ It is instructive to compare this approach with more traditional comparative work across *countries*. For example, it is well known that the Nordic countries are characterised by comparatively high intergenerational mobility. Yet because countries differ in many aspects, it is unclear which aspects of the “Nordic model” are particularly important for intergenerational mobility. As institutions and policies differ less across regions within countries, and because many regions can be distinguished, the area approach can point to specific factors associated with low or high intergenerational mobility.

⁴⁴ Most studies construct intergenerational links, but a recent study by Guell et al. (2018) show that a single cross-sectional data source can be sufficient in some settings. Specifically, their approach requires access to a large cross-sectional file (such as a population census) with (anonymised) information on *names* to approximate intergenerational persistence based on systematic status differences between name groups.

US and UK, intergenerational mobility is particularly low in industrial ‘rust-belt’ areas that suffered from industrial decline.

Figure 1. Probability of reaching the top income quintile when the father was in the lowest quintile in Norway



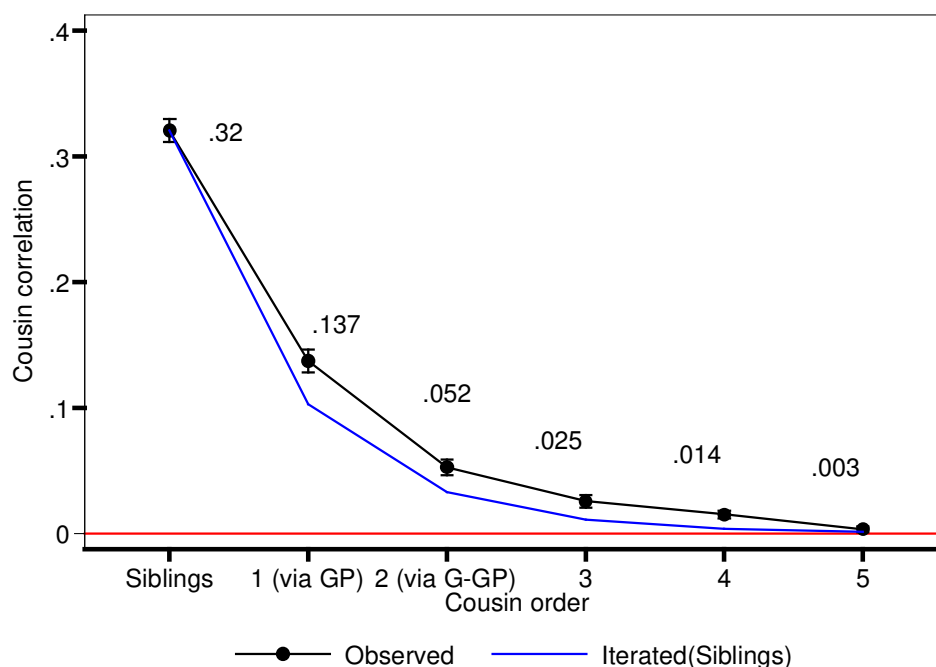
Source: Bütikofer, Dalla-Zuanna and Salvanes (2018).

However, a priori, it is not clear if variation in intergenerational mobility across regions is due to characteristics of the region as such or due to differences in the characteristics of their inhabitants (e.g., the inhabitants in rural and urban areas might be differently selected and experience different intergenerational mobility). Chetty and Hendren (2018) address this question by studying the economic outcomes of families who move between regions. Their causal strategy accounts for movers to be different from non-movers but is based on the assumption that these selection effects do not vary with the age at which children move. The strategy also confirms that places have a substantial causal effect on intergenerational mobility, which in the United States increases linearly with time spent in the “better” location. In contrast, Deutscher (2018) finds that in Australia, places have a greater effect on adult outcomes on upward mobility in the teenage years. The approach used in Chetty and Hendren (2018) and Deutscher (2018) entails observing a large number of movers and therefore requires an administrative data source. Indeed, the causal estimates can be quite noisy if the number of movers is not sufficiently high.

Future work is expected to deepen both the descriptive and causal (“mover”) variants of the area approach and to extend it to other countries. Descriptively, the approach can deepen our knowledge about the geography of intergenerational processes. For example, Chetty et al. (2018) estimate children's earnings and other outcomes in adulthood by parental income, race and gender on an unusually fine spatial level (by U.S. Census tract). Such detailed evidence also allows precise targeting of policies to improve economic opportunity, by indicating specific neighbourhoods and subgroups in which children grow up to have poor outcomes. On the causal variant, the central question is *why* some areas are more successful in promoting economic opportunities than others. The existing literature points to a number of factors that appear closely associated with its causal effect on upward intergenerational mobility. An example for a research design aimed at distinguishing those factors is Laliberté (2018), who decomposes the causal effect of a neighbourhood into components related to local schools and other non-school local factors. His approach

exploits the particular boundaries of school districts in Montreal to show that between 50% and 70% of the long-term benefits of moving to a better area are due to access to better schools rather than to neighbourhoods themselves. This and similar type of research designs will be only feasible with a high degree of collaboration between data providers and researchers due to the sensitivity of the data provided.⁴⁵

Figure 2. Sibling and cousin correlations in years of education in Northern Sweden



Source: Hällsten and Kolk (2020).

This comparison points to an important bottleneck in the availability of administrative records for research purposes in Europe. In most countries, only subsamples of administrative records are provided to researchers (e.g., 2% of social security records in Germany, or 4% in Spain), and the location of a worker is often anonymised at a coarse level. While these data products remain sufficient for many traditional research designs, they are not sufficient for implementing the area approach. The optimal solution is the provision of full population data with detailed spatial information, which may require using secure data environments to protect data confidentiality. A simpler workaround is the preparation and provision of aggregate statistics at fine spatial resolution that are specifically tailored for research purposes.

8.2.2 The multigenerational and extended-kin approach

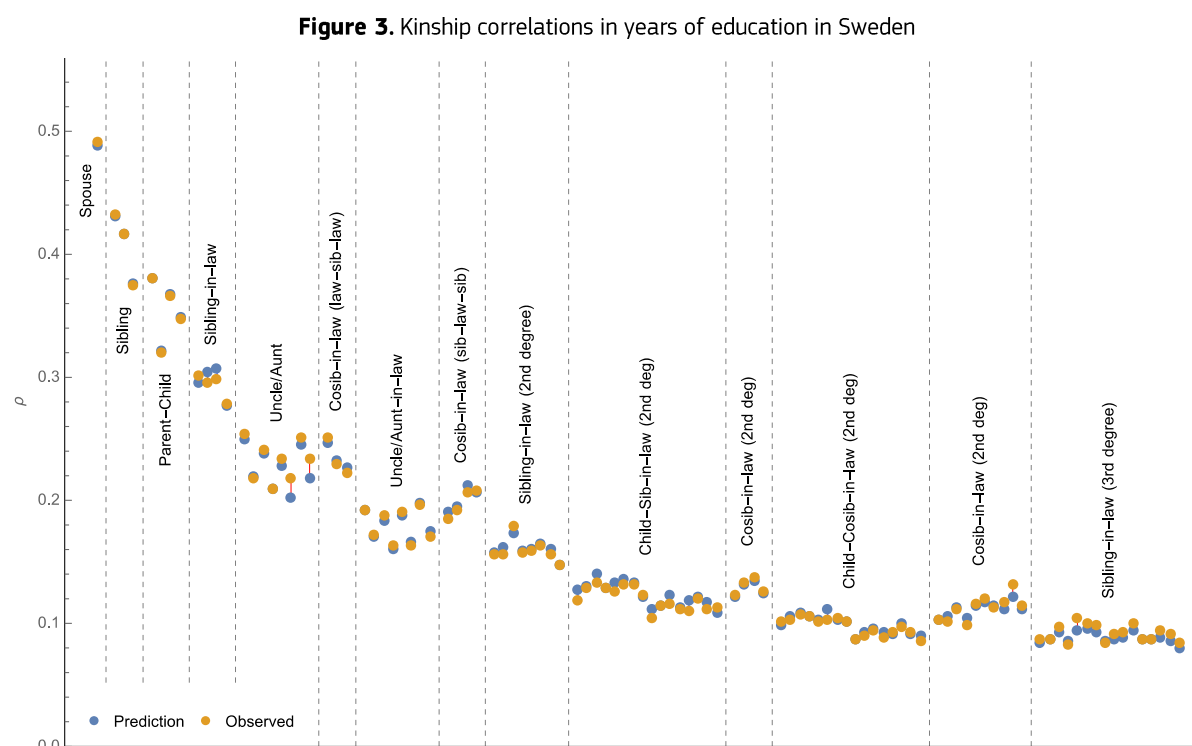
Our knowledge about intergenerational processes is primarily based on parent-child comparisons and on narrow measures of socioeconomic status such as education, income or occupation-based measures. However, socioeconomic status is a multidimensional concept, and any given measure is unlikely to fully capture an individual's status or wellbeing. Simple summary statistics, such as the parent-child correlation in income, may therefore not reveal the full extent to which inequalities are transmitted from parents to children.⁴⁶ One strategy to tackle this issue is to consider a broader range of indicators and measures

⁴⁵ For example, the study by Chetty et al. (2018) has been developed in collaboration with the U.S. Census Bureau.

⁴⁶ This observation is not a blanket criticism of existing studies based on parent-child correlations in unidimensional outcomes. For example, while the school reform considered in Pekkarinen et al. (2009) may have affected many dimensions of socioeconomic status, the finding that it enhanced income mobility makes it likely that it also enhanced other dimensions of socioeconomic mobility. Similarly, neighbourhoods characterised by low upward mobility in income presumably tend to be also characterised by low mobility in other dimensions not directly captured by the data. Unidimensional summary measures can therefore be sufficient for many purposes.

(McKnight et al. 2019) and to interpret or weight them within a specific conceptual framework (e.g., Sen 1985, Aaberge et al. 2011).

An alternative strategy is to keep focus on a particular *outcome* (e.g., education or income) but to treat a person's overall socioeconomic status as a *latent* variable that can never be directly observed by the researcher. The key insight here is that the importance of latent variables and processes can be *indirectly* quantified by considering how inequalities persist in the extended family or “dynasty” beyond the core parent-child relationship. The intuition behind this is that the similarity of extended kins provides indirect information on the importance of latent transmission processes that cannot be directly observed by the researcher. Administrative data open up an exciting opportunity to implement this *dynastic* or *extended-kin* approach.



Source: Collado, Ortuño-Ortín and Stuhler (2018).

The approach is motivated by recent evidence on *multigenerational* mobility, which shows that the socioeconomic status of previous generations remains predictive of child outcomes, even after conditioning on parent outcomes (e.g., Clark and Cummins 2014, Lindahl et al. 2015, Braun and Stuhler 2018, Colagrossi et al. 2019, Engzell et al. 2019).⁴⁷ This observation has important implications for our understanding of intergenerational transmission, as it suggests that the traditional parent-child measures understate the persistence of inequality in the long run (i.e., across multiple generations).⁴⁸ Adermon et al. (2019) extend on this point by showing that in Sweden, socioeconomic outcomes are more persistent on the dynastic than on the individual level. They show that the average socioeconomic outcome of the dynasty in the parents' generation, i.e., siblings of parents, cousins of parents, and so on, is predictive of child outcomes conditional on parent status. Related, Hällsten and Kolk (2020) show that persistence as captured by cousin or dynastic correlations in Sweden is much higher than implied by a simple Markov model in observable characteristics. To match distant family members, Hällsten and Kolk combine administrative data with historical records from

⁴⁷ See Anderson et al. (2018) for a critical review of this growing literature. The recent multigenerational literature has been motivated by earlier evidence on the contrast between parent-child and *sibling* correlations (e.g., Björklund and Jäntti 2019) and on work in economic history that links individuals based on their *surnames*, such as Clark (2014) or Barone and Mocetti (2016).

⁴⁸ That is, persistence declines at less than the geometric rate across generations (i.e., is not just the “iterated” parent-child expectation).

church books. Figure 2 provides an illustration, comparing the size of the sibling, cousin and higher-order cousin correlations, as measured in their data, with the predicted value based on iteration of the sibling correlation. Such research designs would not be feasible with survey data, as they require the high coverage of administrative data sources to link distant family members across multiple sources.

Moreover, the pattern of inequalities in the wider family is informative about the underlying transmission *processes*. In particular, it allows researchers to quantify the importance of latent processes that cannot be directly observed in the data. For example, Braun and Stuhler (2018), Neidhöfer and Stockhausen (2019) and Colagrossi et al. (2019) quantify the intergenerational persistence of latent advantages in a simple latent factor model, using data linked across three or four generations. Collado et al. (2018) extend this approach by making use of many different types of kins, including horizontal kins. They estimate status correlations for 141 distinct kinship types, allowing them to consider a more detailed model of intergenerational and assortative processes. A key observation is that in population-wide administrative registers, one can match very distant sibling *in-laws* by following the chain defined by sibling and assortative links. Figure 3 plots the core set of empirical moments used in their analysis as well the predicted moments from the calibrated model. Consistent with the recent multigenerational evidence, Collado et al. find that latent advantages are transmitted to a much larger extent than observable advantages. They further show that assortative processes between spouses must be much stronger than previously believed to rationalise the pattern of inequality across distant kins. Overall, their results suggest that intergenerational and assortative processes are not well captured by the traditional measures, such as parent-child correlations.

This *dynastic* or *extended-kin* approach can be expected to influence other strands of the literature on intergenerational mobility. For example, an important question is if the observed cross-country differences in parent-child correlations (e.g., Corak 2013) extend to more comprehensive measures of status persistence.

8.2.3 Mobility trends

The *area* and *extended-kin* approach are novel and have only become feasible due to the availability of large-scale administrative data. However, the scale of such sources also allows researchers to deepen their analysis in traditional strands of the literature. For illustration, we briefly review two applications on mobility trends over time. In this setting, administrative sources offer a comparative advantage in two key dimensions. The first relates to the *degree of detail* that register data provide on specific subgroups of the population and specific parts of the earnings distribution. The second relates to the long time coverage of administrative sources and the potential of linking multiple administrative sources with each other.

To illustrate the first advantage, Markussen and Røed (2019) study the trends in intergenerational mobility over time in Norway. Consistent with others, they find that trends in the *average* level of mobility remained fairly stable in the post-war period. However, they also show that children born into the lowest parts of the parental earnings distribution have fallen behind in terms of their earnings in adulthood or a number of other quality-of-life indicators (such as employment, health or family formation). These findings illustrate that standard summary measures of intergenerational mobility may miss important developments in the tails of the earnings distribution or important trends in specific population subgroups. The scale of administrative sources allows researchers to detect such specific patterns, which then allows policymakers to detect important policy issues earlier than what might be possible with survey data.

By linking administrative records, researchers can also provide evidence on mobility trends over very long time intervals. An example is the study by Modalsli (2017), who estimates trends in occupational mobility in Norway over nearly 150 years. The data are based on linked census data between 1865 and 2011, combining intergenerational linkages from modern population registers (from the second half of the 20th century) and linkage methods based on names, birth dates and birthplaces (for the earlier period). Similar attempts to construct intergenerationally linked census records are ongoing in several other countries (e.g., Ruggles et al. 2017), which will offer novel opportunities to understand intergenerational processes over very long time frames. A long-term perspective is important because intergenerational processes are, by definition, slow processes and many of the determinants of structural change over time (e.g., the establishment and expansion of welfare systems or the increased provision of formal education).

8.3 The effect of macroeconomic shocks on intergenerational mobility

How do major economic shocks, such as an economic downturn or recession, affect intergenerational mobility? It is well known that macroeconomic shocks tend to have important distributional effects, affecting the level of inequality in the population (i.e., in the cross-section). However, little is known about their intergenerational implications. For example, while the financial crisis had more adverse effects on disadvantaged demographic groups (e.g., Yagan 2019), there appears to exist no systematic study of how it affected the economic prospects of children from different socioeconomic backgrounds. Still, a handful of studies have examined the intergenerational consequences of other macroeconomic shocks. We review three such studies here before summarising some conceptual issues and open questions for future research.⁴⁹

8.3.1 Previous studies

A positive demand shock: The Norwegian oil boom

A prevalent hypothesis is that positive demand shocks may foster intergenerational mobility by creating opportunities for children from low-income households. Bütikofer et al. (2018) provide a test of this hypothesis in a particular context, the Norwegian oil boom. Their empirical strategy exploits that the oil boom started in a particular time period (the 1970s) and increased labour demand in particular regions (Western Norway). They find that male children born to poor families in oil-rich regions experienced higher upward income mobility (i.e., were more likely to move to the top of their cohort's earnings distribution). While this finding is based on regional differences in the cross-section, placebo tests show that their results are not driven by pre-existing differences between high- and low-oil regions.

The effect on intergenerational *upward* mobility is partly mechanistic, as it is driven by strong local growth due to the oil shock. But Bütikofer et al. (2018) demonstrate that relative mobility also increased (i.e., male children from low-income households profited more strongly from the oil boom than children from richer families). Moreover, they show that income mobility remained high for the next generation, which was indirectly affected (as their parents were exposed to the oil boom). In contrast, the educational attainment of children from upwardly mobile families was lower in high-oil than in low-oil regions. As such, the oil boom increased upward mobility in income but did not have a similar effect on educational mobility—the educational attainment among families profiting from the oil boom remained comparatively low.

A negative demand shock: The Great Depression

Feigenbaum (2015) studies the impact of a severe economic downturn, the Great Depression, and finds that intergenerational mobility declined among sons who grew up in U.S. cities that were particularly strongly affected by the Great Depression. He shows that socioeconomic differences in *geographic* mobility can explain the decline in intergenerational mobility—while sons from high- and low-income families fled distressed cities at a similar rate, the sons from advantaged backgrounds were more likely to migrate to better locations less exposed to the Great Depression. They were also more likely to move longer distances or to move out of state. So while all children were searching for better economic opportunities, the children from more advantage backgrounds were able to make better locational choices.

Transitory demand shocks (boom and bust)

The Great Depression and the Norwegian oil boom represent semi-permanent economic shocks, in which certain industries and regions experienced a sustained shift in labour demand. It is interesting to contrast such sustained shocks with temporary fluctuations in local demand. A particularly extreme example is the recent housing boom-and-bust period in Spain. In the 1990s, the Spanish housing market boomed, generating high demand and wage growth for un- and semi-skilled labour in the construction sector. This growth was particularly pronounced in certain provinces. Lacuesta et al. (2012) show that this housing boom depressed educational attainment, as it incentivised young adults to leave the educational system at the early stages of tertiary education. Importantly, this effect was stronger among children from parents who themselves had low education. The housing boom therefore reduced educational investments, with

⁴⁹ We do not review studies on the intergenerational effect of individual-level or war-related macroeconomic shocks. For example, Havari and Peracchi (2019) show that World War II had important intergenerational effects on human capital transmission.

potentially severe consequences for intergenerational mobility in the subsequent housing bust and the strong contraction in the construction sector after the financial crisis.

8.3.2 Identifying the impact of macroeconomic shocks on intergenerational mobility

Studies that aim to identify the impact of macroeconomic shocks on intergenerational mobility have to address a number of conceptual issues. First, it will typically not suffice to compare the level of intergenerational mobility before and after an economic shock, as such estimates could be affected by secular trends in intergenerational mobility. The most common workaround is to exploit the fact that economic shocks tend to affect different population subgroups differently, which allows researchers to estimate its effects while controlling for broad secular trends on the national level.⁵⁰ A particularly popular strategy is the area approach discussed in Section 2.1 (i.e., comparing areas more heavily exposed to an economic shock—the “treatment areas”—to areas that were less strongly affected—“controls”—in a difference-in-differences or panel design). Indeed, the studies by Bütikofer et al. (2018), Lacuesta et al. (2012) and Feigenbaum (2015) all exploit spatial variation across areas.

A second issue relates to the mapping between *time*-specific economic shocks and *cohort*-specific changes in intergenerational mobility. Economic shocks occur at a specific (and often sharply defined) point in time, such as the Norwegian oil boom starting in the 1970s or the 2007 financial crisis. But when considering trends in intergenerational mobility, researchers typically consider trends across cohorts. This becomes an issue in that while a macroeconomic shock may occur suddenly, its impact on the cohort-specific level of intergenerational mobility is likely to be more gradual, complicating the identification of its causal effect. For this reason, it is more difficult to identify the impact of macroeconomic shocks on mobility than it is to identify the effect of other types of shocks affecting particular cohorts (such as the school reform considered in Pekkarinen et al. 2009). Researchers typically address this issue by focusing on cohorts that are thought to be most strongly affected by the economic shock. For example, Bütikofer et al. (2018) consider cohorts that entered the labour market during the initial stages of the Norwegian oil boom, while Feigenbaum (2015) focuses on the generation coming of age during the Great Depression.

A third issue is that economic shocks may generate *transitional* dynamics in intergenerational mobility over long time periods (because of intergenerational transmission across *generations*) and that different mobility measures capture those transitional effects to a different degree. For example, Nybom and Stuhler (2014) note that a change in relative skill prices will increase intergenerational mobility temporarily in cohorts that were directly affected, but those transitional gains diminish in the next generation. They also show that a Swedish compulsory school reform affected mobility trends in both the directly affected as well as the next generation. The short- and long-term implications of an economic shock on intergenerational mobility can therefore be quite different. Moreover, different measures of the importance of family background weight the short- and long-term consequences to a different extent. For example, *sibling correlations* that quantify the role of family background by measuring the similarity of socioeconomic outcomes between siblings are more immediately affected by economic shocks than parent-child correlations, if socioeconomic outcomes in the parent generation are less affected by an economic shock than the outcomes of their children.

8.3.3 Open research questions and expected developments

An important question is how the recent financial crisis has affected intergenerational mobility. We know that the crisis had different effects on different subgroups (e.g., Pfeffer et al. 2013; Yagan 2019), but little research exists on its intergenerational effects. One issue in studying the effects of recent economic shocks is that standard measures of socioeconomic status, such as income, are more informative in mid-life than in the early stages of a career. For example, in the literature on income mobility it is recommended practice to measure incomes around mid-life (Haider and Solon 2006; Nybom and Stuhler 2017). Such recommendations cannot be followed when studying the impact of recent economic shocks and interest focuses on cohorts that were in school or just entered the labour market at the time of the shock. However, some indicators of socioeconomic status in early life can be predictive of later life outcomes. For example,

⁵⁰ However, this approach only identifies relative differences between groups and is less informative about the total effect on the national level. Researchers may attempt to identify spillovers between groups in a reduced-form design or to identify general equilibrium effects using more structural approaches.

recent research by Athey et al. (2019) provides guidance on how to combine several short-term outcomes into a “surrogate index” for long-term impacts, an idea that could be also applied to the intergenerational literature.

8.4 Conclusions

This report reviewed recent strands of the literature on intergenerational mobility that exploit administrative data sources. The objective was to show how the increased availability has opened the door for novel and exciting research designs, and how these new approaches have the potential (and have started) to enhance our understanding of intergenerational processes and the causal determinants of intergenerational mobility. Unfortunately, in many European countries, large-scale or even population-wide administrative data sources are still not available for research purposes. In other countries such sources exist, but family members cannot be linked between generations. As a consequence, most of the recent evidence on intergenerational processes is either based on data from the United States and Canada or from a small subset of European countries. Researchers have developed workarounds to exploit more widely available sources, such as census data, for intergenerational purposes, but attempts to systematically link census data across generations are progressing only in some countries. Much of the potential of administrative data for intergenerational research therefore remains unused.

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9 Final conclusions and policy recommendations

This final chapter summarises the potential policy implications of the key theoretical and empirical challenges in the study of inequalities discussed in the previous sections:

- A **multidimensional approach** to inequality: A multidimensional approach to inequality monitoring is a necessary condition for a comprehensive, meaningful and effective approach to inequality policy-making. Quality of life is a multi-faceted concept. Any attempt to monitor inequality in human wellbeing should take into account that quality of life goes far beyond material wellbeing and income. We can think of a wide range of other domains that are central to the quality of human life, such as access to knowledge and skills, health, working life, social life and family life, political participation and voice, bodily integrity and safety, or cultural life and recreation. On the one hand, which particular wellbeing dimensions should be measured, monitored and prioritised in the policy agenda is a question open for discussion. On the other hand, it is evident that some of those dimensions have been largely neglected in both public policy and traditional socioeconomic analysis, that tend to focus on income and wealth as far-reaching proxies for wellbeing and therefore for inequalities in wellbeing. For instance, as discussed in chapter 6, only recently inequalities in the cultural sphere are becoming an important concern for social science and public policy.
- Making a **distinction between means and ends**: Keeping a distinction between means and ends to wellbeing is important from a theoretical and empirical analytical perspective, and also from a policy perspective. The Capability Approach paradigm draws a clear demarcation line between inputs (resources) and outputs. The three main conceptual building blocks in the Capability Approach are the resources a person owns or can use, the conversion factors (personal, social or environmental constraints) that determine their ability to convert those resources into desired states or activities, and finally the set of opportunities made feasible to the individual (capabilities) and the actual outcomes realised (functionings) from each individual's capability set. In this light, the Capability Approach views income as an input rather than as a final outcome. Moreover, from the broader multidimensional and multi-tier analytical perspective advocated by the Capability Approach, it becomes evident that persistent inequalities in relevant dimensions of individual wellbeing such as health, education, career opportunities or individual freedom are not robustly correlated with income. Once again, this is a sound argument in favour of a full-fledged multidimensional approach to inequality policies, and also a strong argument against a narrow policy focus on economic inequalities alone.
- A **lifetime perspective** on inequalities: What people consider as the most salient quality of life domains, capabilities and functionings, fluctuates over the life course for a variety of reasons. To be able to fully understand inequalities at different stages of the life cycle, it is important to try and define appropriate wellbeing indicators for different age groups, namely children, adults and seniors. In general, key themes associated to different life stages should be taken into consideration when drafting the inequality policy agenda. For instance, any policy intervention tackling inequalities in older age should go beyond income related measures and look also at a range of other personal and environmental factors, such as health, mobility concerns and the capacity of seniors to enjoy good social relations.

On a related note, embracing a lifetime approach could also lead to valuable policy insights when analysing economic inequalities. In particular, the study of long-run or lifetime incomes across cohorts of individuals within the same country will deliver profound insights on the impact of the overall tax-transfer system—during the active part of the life cycle and later in the retirement period—on actual inequality levels.

- **Fine-grained resolution** in data collection and analysis: Inequalities and inequality related policies can be discussed at different spatial resolution levels: from countries to regions, and from local units to smaller residential areas and neighbourhoods. Recently, a number of studies have brought to the fore of the policy debate the occurrence of substantial differences in outcomes in domains such as health, education, innovation, and economic growth, even within the same urban area. The increased availability of “administrative data” sources (i.e. anonymised data from official registries, such as tax and social security records) and “big-data”

from new digital sources of information (e.g. mobile phones, social media and credit cards) is opening the door to an increased granularity in inequality research. The analyses based on new micro-data sources aim to complement official statistics and to provide insights on segregation and inequalities at much higher resolution level—especially when the spatial (or temporal) resolution of more conventional statistical sources is simply not enough. As illustrated by projects like the “Atlas of Inequality”, big-data sources can help city-level policymakers monitor in a timely fashion the changing nature of inequalities and segregation at neighbourhood level.

- **Inequality of opportunity:** (In)equality of opportunity has become a blanket term in public and policy debate. More often than not, its meaning remains vague and subject to different interpretations. In this report we emphasise the conceptual distinction between individual efforts and choices on the one hand, and predetermined circumstances that are external to the individual (i.e. factors beyond their control) on the other hand. In keeping with this distinction, the focus of the inequality debate can be shifted from measuring actual inequality levels to analysing the external factors underpinning those unequal outcomes. From an equality of opportunity perspective, any given distribution of outcomes could be labelled as “socially just” provided that it derives from differences in factors that individuals can be held responsible for. Therefore, an opportunity egalitarian society could be described as one that aims to secure an equal distribution of opportunities, rather than an equal distribution of outcomes. Moreover, the degree of inequality of opportunity can be estimated empirically by measuring the portion of the inequality in outcomes that is attributable to circumstances exogenous to the individual, such as gender, race or family background. Finally, a deeper understanding of the pervasiveness and magnitude of inequalities of opportunity in a reference population, alongside the identification of the external factors that are driving those unequal opportunities, will provide useful insights for fine-tuning social protection and redistributive policies.
- The **intergenerational transmission** of status: Children from well-off families are more likely to achieve higher levels of education, occupational status or earnings than children from disadvantaged backgrounds. Intergenerational mobility studies bring the family links and the time dimension to the fore, in an attempt to measure and explain the “leverage effect” of past socioeconomic success. Conceptually, intergenerational mobility is related to the analysis of inequality of opportunities, since the impact of family backgrounds is beyond the sphere of individual responsibility. As discussed in this report, novel analytical approaches to evaluate the intergenerational mobility impacts of specific policies and/or macroeconomic shocks have been developed and applied to rich administrative micro-data sources. For instance, the use of the multigenerational “extended-kin” approach and the area approach in combination with administrative data, can help better understand the entrenchment of inequalities within a reference population and the spatial heterogeneity in the transmission of advantages/disadvantages.

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