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# Measuring the Distribution of Household Income, Consumption and Wealth: State of Play and Measurement Challenges

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## **Abstract**

This paper focuses on the data challenges encountered while measuring vertical economic inequality, i.e. inequality of income and consumption, and—whenever feasible—wealth, among households or individuals ranked by the level of their economic resources. The paper presents a critical assessment of international databases on inequality. Among the worrisome facts is that international databases not only show different levels of inequality but, for some countries (especially in Sub-Saharan Africa), diverging trends also. A key factor behind the limitations of existing databases is the quality of the underlying household surveys (microdata) used as inputs for their construction. Among the salient challenges is that household surveys suffer from undercoverage and underreporting of top incomes, i.e. the “missing rich”. Missing the rich introduces a bias in the measured inequality indicators, a bias that could go in either direction. Another limitation in existing inequality indicators is that the typical welfare metrics are disposable income and/or consumption expenditures; these, however, take into account only part of the effect that taxes and transfers have on people’s economic well-being. The paper suggests that a more comprehensive assessment needs to use an income variable that includes social transfers in-kind (especially education and health), and adds the effect of consumption taxes and subsidies as well.

Keywords: Inequality, international databases, household surveys, top incomes, economic well-being, taxes, cash and in-kind transfers

JEL codes: C81, D31, D63, H41

# Measuring the distribution of household income, Consumption and Wealth: state of play and Measurement Challenges<sup>1</sup>

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## Abstract

This paper focuses on the data challenges encountered while measuring vertical economic inequality, i.e. inequality of income and consumption, and—whenever feasible—wealth, among households or individuals ranked by the level of their economic resources. The paper presents a critical assessment of international databases on inequality. Among the worrisome facts is that international databases not only show different levels of inequality but, for some countries (especially in Sub-Saharan Africa), diverging trends also. A key factor behind the limitations of existing databases is the quality of the underlying household surveys (microdata) used as inputs for their construction. Among the salient challenges is that household surveys suffer from undercoverage and underreporting of top incomes, i.e. the “missing rich.” Missing the rich introduces a bias in the measured inequality indicators, a bias that could go in either direction. Another limitation in existing inequality indicators is that the typical welfare metrics are disposable income and/or consumption expenditures; these, however, take into account only part of the effect that taxes and transfers have on people’s economic well-being. The paper suggests that a more comprehensive assessment needs to use an income variable that includes social transfers in-kind (especially education and health), and adds the effect of consumption taxes and subsidies as well.

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## 5.1. Introduction

After decades of relative neglect, the issue of how household economic resources (income, consumption, and wealth) are distributed is back on the agenda. We have moved from "bringing distribution in from the cold", as Tony Atkinson wrote in 1997, to putting it in the political and research spotlights.<sup>2</sup> The rising prominence of distribution can be readily observed in the UN Sustainable Development Goals which, in contrast to the previous Millennium Development Goals, now include a specific goal – Goal 10 – to reduce inequality within and among countries. Similarly, multilateral organisations such as the IMF, the OECD, UN agencies and the World Bank as well as global non-governmental groups have been paying unprecedented attention to the causes and consequences of economic inequality.<sup>3</sup> This growing prominence is, in large measure, the product of significant changes in the distribution of income and wealth — in particular, rising inequality in the advanced countries — and their implications for political outcomes.<sup>4</sup> It is also the consequence of developments in economic theory and improvements in the available data.<sup>5</sup>

Why do we care about the distribution of economic resources across individuals and households? This is an issue charged with value judgments, where different authors have arrived at very different conclusions. A conventional view in economics has long argued that incentives are needed to promote economic growth, and that these incentives imply some degree of inequality in material rewards (Mirrlees, 1971). Higher inequalities may also result from a historical process whereby some people escape from destitution before others, as the benefits from improved

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<sup>2</sup> See, for example, Alvaredo and Gasparini (2015), Anand and Segal (2016), Atkinson (2015), Bourguignon (2015a), Bourguignon and Morrisson (2002), Bourguignon, Ferreira and Lustig (2005), Cornia (2014), Deaton (2013), Ferreira et al. (2012), Ferreira et al. (2016), Lopez-Calva and Lustig (2010), Milanovic (2016), Piketty (2014) and Stiglitz (2012). See also Klasen et al. (2018) and other chapters of the report by the *International Panel on Social Progress*.

<sup>3</sup> See, for example, [Dabla-Norris et al. \(2015\)](#); Gurria (2011), ILO (2015) [https://euro.indiana.edu/doc/archive/past-events/wcms\\_324678.pdf](https://euro.indiana.edu/doc/archive/past-events/wcms_324678.pdf); Love (2016), OECD (2011, 2015); Ostry et al. (2014); Oxfam (2016); Save the Children (2012); UNDESA (2015); UNDP (2014); ISSC, IDS and UNESCO (2016); UNICEF (2011); World Bank (2016). Also, see statements by officials: <https://www.ft.com/content/b3462520-805b-11e3-853f-00144feab7de>; <https://insight.kellogg.northwestern.edu/article/christine-lagarde-on-income-inequality-brexite-and-the-power-of-mms>; [http://oecdobserver.org/news/fullstory.php/aid/3717/Tackling\\_inequality.html](http://oecdobserver.org/news/fullstory.php/aid/3717/Tackling_inequality.html); <https://openknowledge.worldbank.org/handle/10986/25078>; <http://www.un.org/en/development/desa/news/social/social-inequalities.html>.

<sup>4</sup> See, for example, [http://www.nytimes.com/2016/10/16/upshot/whats-behind-a-rise-in-ethnic-nationalism-maybe-the-economy.html?\\_r=0](http://www.nytimes.com/2016/10/16/upshot/whats-behind-a-rise-in-ethnic-nationalism-maybe-the-economy.html?_r=0)

<sup>5</sup> One of the key developments in economic theory has been the demonstration that, once the Arrow-Debreu conditions are relaxed (that is, no increasing returns, no monopolies, a complete set of markets for present and future goods, complete insurance markets, fully available and symmetric information, and available lump sum transfer instruments), there is no separation of efficiency and equity. With imperfect information, lumpsum redistribution of endowments can improve efficiency (in the sense of making at least one person better off without making anyone else worse off) under certain conditions, or worsen it under others. In the absence of lump sum instruments, market interventions may reduce efficiency, but improve equity. Efficiency and equity have to be taken together, i.e. they are not separable.

technologies, higher living standards and better policies reach some people and communities first before spreading elsewhere (Deaton, 2013).

From a normative standpoint, the interest in inequality is related to considerations about justice and, as emphasized by Rawls (1971), about fairness. Rawls suggested that citizens blocked by a “veil of ignorance” — unknowing about their lot in life — would choose a social arrangement that maximizes the level of welfare achieved by the less well-off person (the maximin principle) as the accepted social contract. This principle sets up the basic notion of justice as equality of *ex ante* opportunity (WDR, 2006). Equality of opportunities, in this way, entails that individuals’ achievements in life — including their income — are independent from initial circumstances (See the discussion by François Bourguignon in the present report). However, inequality of outcomes may be unpalatable as such, too. High inequality in both opportunities and outcomes are perceived to be problematic in most societies.<sup>6</sup>

In addition to normative concerns, there are instrumental reasons to care about inequality. A more unequal distribution of economic resources lowers the impact of economic growth on reducing absolute poverty.<sup>7</sup> Economic inequalities may also translate into inequalities in health and education which, by lowering productive opportunities, may dampen the overall productivity of the economy and economic growth. Economic inequality manifests itself also as misallocation and inefficiency in the use of resources. Since some economic disparities arise from market failures, reducing them can have important payoffs in terms of productivity and efficiency, boosting individuals’ capacity to generate income and contribute to aggregate economic growth.

Economic inequalities may also promote social and political inequality and breed social conflict, disaffection, and violence. Very high levels of wealth and income concentration at the top are associated with a disproportionate amount of influence by certain actors and lead to state capture and policy distortions, whereby the interests of those at the top are systematically favoured (Esteban and Ray, 2006). Inequality, in this way, can shape not only the bargaining power of actors today, but those of the next generation as well. In sum, high inequality may be associated with lower inter-generational mobility, trapping of the poor in a state of permanent deprivation. High concentration of capital is also likely to generate persistent inequalities of income in a vicious circle (Piketty, 2015). Finally, the distribution of household economic resources has implications for macroeconomic policies.<sup>8</sup> For example, the size and distribution of assets and liabilities has implications for macroeconomic stability, while differences in household savings rates and wealth-to-income ratios across the distribution have implications for demand management, and may explain the weakness of the post-crisis recovery.

Given its prominence and far-reaching consequences, measuring the level and evolution of economic inequality accurately is of utmost importance. This paper focuses on the data challenges encountered while measuring vertical economic inequality, i.e. inequality of income and consumption, and—whenever feasible—wealth among households or individuals ranked by the level

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<sup>6</sup> See, for example, Pew Research Global Attitudes Project. See discussion on the subject in World Bank (2017).

<sup>7</sup> See Bourguignon (2003) and Ravallion (2001).

<sup>8</sup> See, for example, Alvaredo, Atkinson and Morelli (2017).

of their economic resources.<sup>9</sup> The World Bank’s *Monitoring Global Poverty: Report of the Commission on Global Poverty* (Atkinson, 2016) complements the issues discussed here in a number of ways, for instance, on how to tackle underreporting and noncoverage at the bottom of the distribution; on the limitations of available data on purchasing power parities; and on how to address the shortcomings of price indexes. This paper is not meant to be exhaustive concerning all topics relevant to economic inequality: it focuses on some of the areas that, in the view of the author, require greater investment by the statistical and research communities. In particular, the paper does not present an overview of inequality trends or discuss the advantages and disadvantages of specific summary inequality indicators. These topics have been thoroughly covered elsewhere.<sup>10</sup>

The paper is organized as follows. The next section presents a critical assessment of international databases on inequality. As we shall see, among the worrisome facts is that international databases not only show different levels of inequality but, for some countries (especially in Sub-Saharan Africa), diverging trends also. A key factor behind the limitations of these databases is the quality of the underlying data: that is, of the household surveys (microdata) used as inputs for their construction. The challenges encountered when running household surveys are the topic of Section 3. Among the salient challenges is that household surveys suffer from undercoverage and underreporting of top incomes, i.e. the “missing rich.” Given the importance for inequality measurement, the missing rich problem is taken up in Section 4, which presents an analytical taxonomy of approaches to correct for the missing rich. As discussed in Section 2, the typical welfare metrics used to measure inequality in international databases are disposable income and/or consumption expenditures; these, however, take into account only part of the effect that taxes and transfers have on people’s economic well-being. Section 5 suggests that a more comprehensive assessment needs to use an income and/or consumption variable that includes social transfers in-kind (especially education and health), and adds the effect of consumption taxes and subsidies as well. Section 6 presents recommendations.

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<sup>9</sup> Measuring inequality of opportunity, horizontal inequality — that is, inequality among socio-economic and demographic groups —, and intra-household inequality are discussed in other chapters of the OECD publication “For good measure: advancing research on well-being metrics beyond GDP” (Durand et al., forthcoming).

<sup>10</sup> For trends, see citations in footnote 2. For the properties and advantages and disadvantages of indicators see, for example, Atkinson and Bourguignon (2000 and 2015a), Cowell (2009), Duclos and Araar (2006), and Jenkins and Van Kerm (2009). For discussions on inequality beyond the income dimensions see Sen’s pioneering article “Inequality of What?” (Sen, 1980) and the pertinent chapters in Atkinson and Bourguignon’s *Handbook on Income Distribution* (2015a) such as those by Aaberge and Brandolini (2015) on multidimensional inequality, Koen et al. (2015) on inequality and well-being and Roemer and Trannoy (2015) on inequality of opportunity. Also, on the latter, see Aaberge, Mogstad and Peragine (2011). Also, see Akerlof and Kranton (2000) on identity-driven inequality. On measures of polarisation, see Chakravarty (2009). For an overview of gender inequality, horizontal inequality, and inequality within the household, see the chapter by Deere, Kanbur and Stewart in the OECD publication “For good measure: advancing research on well-being metrics beyond GDP” (Durand et al., forthcoming).

## 5.2. Measuring Economic Inequality: Scope and Limitations of International Databases<sup>11</sup>

As a result of multiple efforts by academics, statistical offices and international organisations to improve and harmonize inequality data, there has been an increase in the number of publicly available databases providing measures of economic inequality covering a broad range of countries, ranging from specific world regions (e.g. Latin America, OECD countries) or all/most countries in the world. All these databases contain summary statistics (the most common being the Gini coefficient) that describe (with very few exceptions) national-level inequality in incomes or consumption expenditures in multiple countries over multiple years. These cross-national inequality databases are being used by researchers, with increasing frequency, to document global or regional inequality trends (e.g. Atkinson and Bourguignon, 2015; Atkinson, 2015; Bourguignon, 2015a; and Piketty, 2014), as well as by scholars interested in including inequality measures in cross-country regression analyses, either as dependent or independent variables (e.g. Acemoglu et al., 2015; and Ostry et al., 2014). Yet, these different databases are often designed for different purposes, and constructed in very different ways. Given that results could be sensitive to the choice of dataset, a special issue of the *Journal of Economic Inequality*, edited by Ferreira and Lustig (2015), was devoted to an assessment of the merits and shortcomings of eight such databases. Some of the conclusions are summarized below.

Depending on the source of the summary inequality statistics they report, there are four types of databases among those which rely directly or indirectly on household surveys.<sup>12</sup>

- *Micro-based datasets*, which calculate inequality measures directly from household surveys.<sup>13</sup> These include: [CEPALSTAT](#), by the UN Economic Commission for Latin America and the Caribbean, which provides income distribution estimates for Latin American countries and is computed by ECLAC based on the microdata transmitted by statistical offices in the region; the [Standard Indicators](#) of the Commitment to Equity (CEQ) Institute, Tulane University; the income distribution estimates underpinning the [EUROMOD](#) microsimulation model (University of Essex); the OECD Income Distribution Database (IDD), which provides indicators and semi-aggregated tables computed by national contact points in member countries based on common definitions and treatments; the microdata files on the distribution of income and wealth provided by the Luxembourg Income Study; the Socio-Economic Database for Latin America and the

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<sup>11</sup> This section draws largely from Ferreira, Lustig and Teles (2015).

<sup>12</sup> Atkinson et al. (2010) discuss a hierarchy of methodologies employed in the standardisation of income inequality data sets. “In short,” they write, “we have a ‘hierarchy’ of degrees of standardization: 1. Common survey instrument (European Community Household Panel, ECHP); 2. Ex-ante harmonized framework (EU-SILC); 3. Ex-post standardized microdata (LIS); 4. Ex-post customized results (OECD); 5. Meta-analyses of results (Kuznets)” (p. 103).

<sup>13</sup> By “directly” here it is meant that indicators were calculated directly by the organisation or by the national statistical office but following specific guidelines that ensure comparability. For details on each dataset see Table 2 in Ferreira, Lustig, and Teles, op. cit.

Caribbean ([SEDLAC](#)), compiled by CEDLAS at Universidad Nacional de La Plata and the World Bank; and [PovcalNet](#) (World Development Indicators, World Bank).<sup>14</sup>

- *Secondary Sources Datasets*, which combine inequality indicators from a variety of other sources, typically from household surveys: these include the [ATG](#) (All the Ginis); the [GINI](#) Project; and the [WIID](#) (World Income Inequality Database/UNU-WIDER).<sup>15</sup>
- *Imputation and Statistical Inference-based Datasets*. This type of dataset generates inequality measures through a variety of imputation and statistical inference methods instead of relying directly on household surveys or unit-record datasets. These include the Global Consumption and Income Project ([GCIP](#)); the Standardized World Income Inequality Database ([SWIID](#)); and the University of Texas Income Inequality Project ([UTIP](#)).<sup>16</sup>
- Finally, there is the World Wealth and Income Database ([WID.world](#)) launched in January 2017, whose precursor was the World Top Incomes Database (WTID) (Alvaredo et al., 2016). Unlike the other datasets, WID.world uses information from tax returns (mainly) to estimate the share of income earned by certain groups at the top of the distribution (such as the richest 1% or 0.5% of the population) and gross up the income totals to match their equivalent to National Accounts. WID.world includes series on income inequality for more than 30 countries, spanning most of the 20th and early 21st centuries, with over 40 additional countries now under study. The database was recently extended to study the long-run evolution of top wealth shares.<sup>17</sup> The key feature of WID.world is to combine fiscal data (tax data, in particular), survey data and national accounts data in a systematic manner. This characteristic sets it apart from the other datasets which rely on survey data almost exclusively, and from the datasets which rely on imputations or statistical inference. As stated on its website, “the overall long-run objective of WID.world is to be able to produce Distributional National Accounts (DINA), that is, to provide annual estimates of the distribution of income and wealth using concepts of income and wealth that are consistent with the macroeconomic national accounts”.<sup>18</sup> Chapter 6 of the OECD publication “For good measure: advancing research on well-being metrics beyond GDP” (Durand et al., forthcoming) discusses in detail the proposed methodology to accomplish this objective.

The above datasets differ in a number of ways. First, and most obviously, they differ in their geographical coverage, hence on the quality of the underlying national data feeding them. Second, they differ in the nature of the individual welfare metric used: given that in most of the developing world household surveys are consumption-based, the existing datasets that are global in reach

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<sup>14</sup> It should be noted that the inequality measures not always are produced directly from the microdata as in a number of countries only grouped data is available.

<sup>15</sup> See Atkinson, A. B., and Brandolini (2001).

<sup>16</sup> For a discussion of the limitations of SWID, see Jenkins (2015).

<sup>17</sup> Saez and Zucman (2016), Alvaredo, Atkinson and Morelli (2016) and Garbinti, Goupille-Lebret and Piketty (2016).

<sup>18</sup> The first series from the DINA project are already available in WID.world for the US and France.



report consumption inequality for most developing and emerging countries, and income inequality for advanced countries and Latin America. Third, for advanced countries, economic inequality is typically measured based on equivalised income (i.e. household's income measured by pooling the income streams of each household member and then attributing this to each member, based on an "adjustment" to reflect differences in needs across households of different size and structure) while in the rest of the world, per capita consumption or income is used. Fourth, while in principle the income variable should be disposable income (i.e. income after direct taxes and current transfers), this is often not clear when it comes to developing countries' data, where it is often difficult to establish whether the reported income is net of direct taxes, gross, or pre-transfers. Likewise, while income or consumption should include consumption of goods produced for own production and imputed rent of owner's occupied housing, in practice this is not the case in general and, in some cases, it is hard to tell.

Furthermore, the databases differ on whether adjustments (and which ones) are made to the microdata to correct for underreporting, to eliminate outliers, or to address missing responses.<sup>19</sup> While in most OECD countries such adjustments and data cleaning are performed by the statistical offices themselves, before making the data available to users, such practice is far less common in low and middle income countries, implying that the international datasets with broad geographic coverage often rely on adjustments implemented by the agency responsible for the secondary data or on data non-adjusted for item non-response. For the datasets which use imputation methods or statistical inference, results are sensitive to the methods utilised, and one often does not have the full information on the characteristics of the underlying data even if the methods are described with care (which is also not always the case).<sup>20</sup>

Given the differences in definitions and methods across datasets, the analyses can therefore yield conflicting pictures of economic inequality, both in levels and in trends, depending on the dataset.<sup>21</sup> For example, in the case of Sub-Saharan Africa (SSA) and its inequality dynamics over the 1990s and 2000s, the IMF *Fiscal Monitor* (2012, p. 51) suggests that in 11 out of 16 SSA countries inequality had fallen between the periods 1985–1995 and 2000–2010. However, as observed in Table 1, when compared with the World Bank PovcalNet inequality trends for the same countries, not only levels but, more importantly, also the direction of change is sensitive to the choice of dataset. Matters get even more complicated if we draw on other datasets as well.

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<sup>19</sup> For a summary of how international datasets differ see, for example, Table 2 in Ferreira, Lustig and Teles (op. cit.)

<sup>20</sup> Table 2 in Ferreira, Lustig and Teles (2015), presents a summary of the main features of eight of the existing datasets. Panel A refers to the microdata-based datasets, and Panels B and C refer to the secondary source and imputation-based datasets.

<sup>21</sup> See Bourguignon (2015b); Ferreira, Lustig and Teles (2015); Gasparini and Tornarolli (2015); Jenkins (2015); Ravallion (2015); Smeeding and Latner (2015); Wittenberg (2015).

**Table 1 - Change in Inequality 1985-1995 to 2000-2010**

Country	IMF Fiscal Monitor	PovcalNet Average
Côte d'Ivoire	5.0	6.5
Ghana	2.4	6.3
Kenya	-6.2	-2.1
Madagascar	-1.0	0.2
Niger	-6.2	0.4
Senegal	-7.8	-7.6
Tanzania	-3.1	2.3
Zambia	-13.5	-3.5

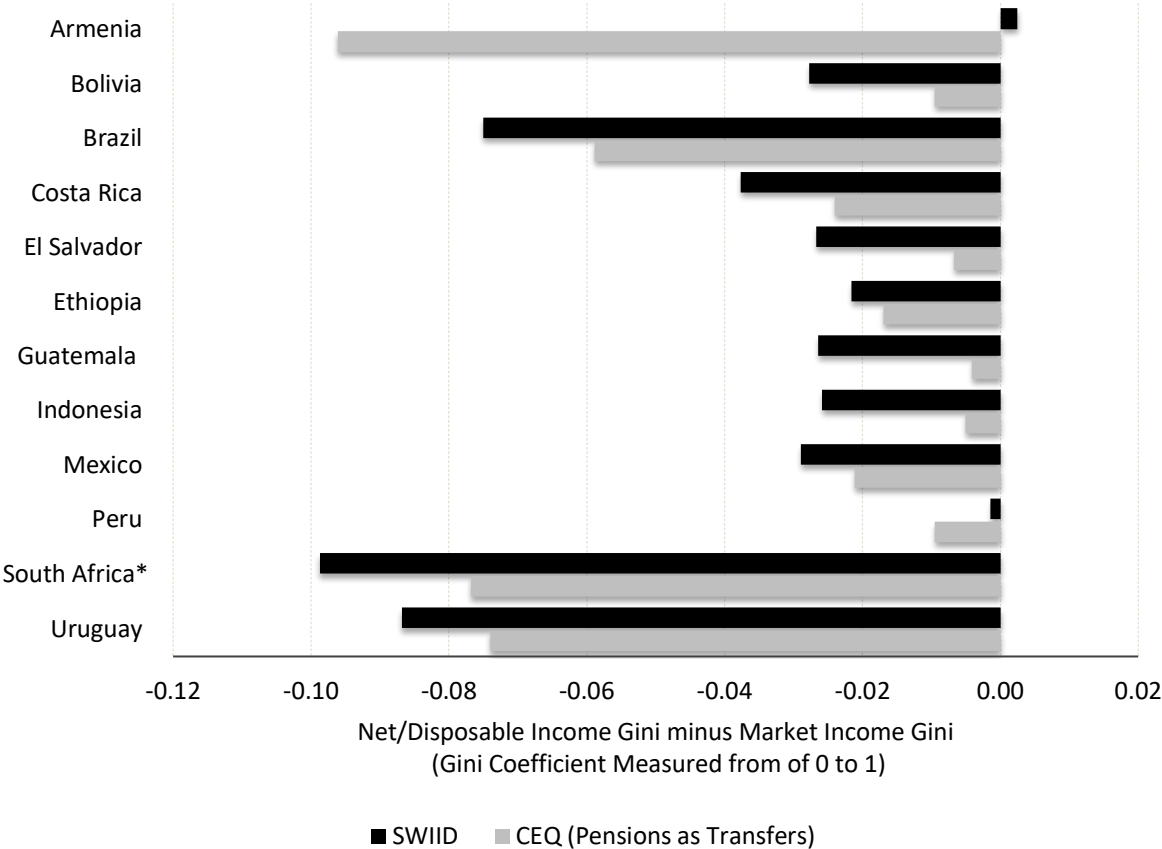
Source: Author, based on Ferreira, Lustig and Teles (2015), Table 5.

Furthermore, important questions such as whether or not economic inequality has converged convergence across countries in the world – the finding that income inequality has fallen in what had been highly unequal countries, and risen in countries that had been more egalitarian (Benabou, 1996; Bleaney and Nishiyama. 2003; and Ravallion. (2003) – are affected by the choice of dataset. As shown in Lustig and Teles (2016), different datasets frequently produce different results in terms of inequality convergence, even when the countries, the welfare concept, the inequality metric and the time period are the same.

Assessments of fiscal redistribution are also sensitive to the choice of datasets. Figure 1 shows the difference between the Gini coefficients for disposable (i.e. net) incomes and for market incomes for the same survey and country, as estimated both by CEQ (which calculates them through a detailed fiscal incidence analysis, validated by local experts and a series of robustness checks) and SWIID (where all data points are estimated through multiple imputation methods using whichever data are available from other sources as the basis for the so-called "rectangularisation"). While the discrepancies between the two sources are not systematic (i.e. sometimes SWIID's estimate of redistribution is higher and sometimes lower than CEQ's), they can be quite large (e.g. Guatemala, and Indonesia) or contradictory (e.g. Armenia, where taxes and

benefits are unequalising according to SWIID – i.e., net income inequality is higher than market income inequality – and equalising in CEQ).<sup>22</sup>

**Figure 1 - Fiscal Redistribution: Change in Gini from Two Databases**



*Note:* Difference is measured in Gini points. CEQ’s Disposable Income is equivalent to SWIID’s Net Income, e.g. market income after taxes and government cash transfers. Based on Younger and Khachatryan (2014) in the case of Armenia; Paz Arauco et al. (2014) for Bolivia; Higgins and Pereira (2014) for Brazil; Sauma and Trejos (2014) for Costa Rica; Beneke, Lustig, and Oliva (2018) for El Salvador; Hill et al. (2017) for Ethiopia; Cabrera, Lustig, and Moran (2015) for Guatemala; Afkar et al. (2017) for Indonesia; Scott (2014) for Mexico; Jaramillo (2014) for Peru; Inchauste et al. (2017) for South Africa; and Bucheli et al. (2014) for Uruguay. For both data sources, contributory pensions were classified as a government transfer (CEQ has estimates for pensions as deferred income-part of market income-as well). Comparisons for Bolivia, Brazil, Peru, and Uruguay refer to 2009; for Costa Rica, Guatemala, Mexico, and South Africa to 2010; for Armenia and El Salvador to 2011; for Indonesia to 2012. The comparison for Ethiopia is made with the CEQ estimate for 2011 and the SWIID estimate for 2010.

*Source:* CEQ Institute Data Center on Fiscal Redistribution and SWIID: V 5.0 database.

<sup>22</sup> Such significant discrepancies suggest that caution is needed when interpreting the results of cross-country regression analysis based on the SWIID imputation-based data, such as Acemoglu et al. (2013) and Ostry et al. (2014).

The above discussion makes clear that, basically, many of the limitations of the international databases are due to the limitations of their main input: country-level household surveys. We turn to this issue in the next section.

### 5.3. Household Surveys: Data Challenges

The overwhelming majority of analysis on income, consumption and wealth inequality over the last four decades has been based (directly or indirectly) on household surveys, the main data source for research on distribution. While data availability, coverage, and quality have improved relative to 2009 when the Stiglitz-Sen-Fitoussi report was released, there are still a number of important issues to be resolved. Furthermore, the problems faced by high-income countries in measuring distribution of economic well-being are orders of magnitude larger in poorer and middle-income countries, where surveys are undertaken infrequently (if at all), generally based on different welfare metrics (either income or consumption), with potentially inadequate and outdated sampling frames, and often with large rates of non-response.<sup>23</sup>

Most OECD countries undertake regular (annual, sometimes every 2 or 3 years) collections of income distribution data, based on household surveys or registers that started in the 1980s or 1990s. Household budget surveys are undertaken in OECD countries around every 5 years, typically based on diaries that households use to record the value of their consumption expenditures.<sup>24</sup> Even in the advanced OECD countries, however, there are important challenges in terms of coverage of various income streams (e.g. imputed rents) or asset types (e.g. pension wealth or the stock of consumer durables), of frequency of data-collections and of timeliness of the resulting estimates, which in many countries lag by *years* the timing of releases of GDP data. In these areas, despite the many initiatives that have been taken by statistical offices since 2009, we are still far from the objective of feeding policy discussion with income distribution data that are as timely as conventional measures of quarterly GDP growth.

The picture of data availability is different in the developing countries. The number of low- and middle-income countries with household surveys has increased dramatically since 1990. For instance, the World Bank estimate of extreme poverty in 1990 was based on data for only 22 countries. The data in the World Bank's PovcalNet presently cover 153 countries of which 34, as of July 2013, are classified as High Income (Atkinson, 2016).<sup>25</sup> However, lack of data is still a problem. In the Middle East and North Africa (MENA) region, where there are 19 countries, only around half are covered by PovcalNet. Furthermore, according to World Bank (2016) the largest possible set of countries on which at least two comparable data points are available between the years of 2008 and 2013 was 83 countries. This set covered 75% of the world's population but fewer than half of the world's countries; population coverage was 94% in the East Asia and Pacific

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<sup>23</sup> See, for instance, Ferreira, Lustig, and Teles (2015).

<sup>24</sup> See the section on the limitations and shortcomings of international datasets below. Also see Ferreira, Lustig and Teles (2015).

<sup>25</sup> To put this number in perspective, in January 2016, the United Nations had 193 members and 2 permanent observers (the Vatican and Palestine).

region but only 23% in Sub-Saharan Africa.<sup>26</sup> <sup>27</sup> Even if surveys exist, in many countries governments still restrict access to the microdata, a factor that limits the ability of independent researchers to carry out an analysis of their own.

A second problem is that, with exceptions, household surveys collect data on either income or consumption, which significantly limits the possibility of undertaking the joint analysis of both variables and rigorous cross-country comparisons. Of the 83 countries included in World Bank (2016), for example, 34 contained consumption data and 49 contained income data. The latter included primarily OECD countries and Latin America. If OECD high-income countries are excluded, of the 1,165 observations on income distribution included in the World Bank’s PovcalNet database, 41% (59%) were income- (consumption-) based (Table 2). While the distribution of income – if income is properly measured – may closely mirror that of consumption expenditures in countries at low levels of economic development, that assumption becomes less tenable as countries develop and household saving rates increase, casting doubts on the practice of combining measures of income and consumption inequalities as if they were describing the same underlying phenomenon.<sup>28</sup>

**Table 2. Income and Consumption Distributions in PovcalNet**

	All of PovcalNet		
	Micro data	Grouped data	Total (in %)
Income	399	79	478 (41%)
Consumption	563	124	687 (59%)
Total	962	203	1,165 (100%)

Note: This table excludes distributions from high-income countries available in the LIS and/or other databases.

Source: Ferreira et al. (2016), Table 2.

While there are international conventions and standards for measuring *income* distribution (first articulated in the 2001 Canberra Group Handbook, codified in the 2003 standards adopted by the International Conference of Labor Statisticians, and brought up-to-date with the 2011 revision of the Canberra Handbook), important issues – such as the systematic underreporting of incomes at both extremes – subsist.

<sup>26</sup> “The geographical coverage across regions was not uniform. Of the 83 countries, 24 belonged to a single region, Eastern Europe and Central Asia, while East Asia and Pacific, Latin America and the Caribbean, and Sub-Saharan Africa contributed 8, 16, and 9 countries, respectively. In South Asia, 4 countries were covered, and, in the Middle East and North Africa, 2.” (World Bank, 2016, p. 53)

<sup>27</sup> The World Bank’s PovcalNet indicates the policy regarding public access in each country contained in their database. <http://iresearch.worldbank.org/PovcalNet/data.aspx>

<sup>28</sup> The GCIP database described above standardizes across the welfare concepts measured in surveys to supply pure income-based estimates of global inequality (Lahoti, Jayadev, and Reddy 2015).

Second, while the World Bank's Living Standards Measurement Surveys (LSMS) use a series of guidelines to measure household *consumption*, no international conventions or guidelines exist. Frequently, the instruments that are used to collect micro-level data on consumption expenditures (household budget surveys) are conducted with the main goal of deriving average-weights for the consumer price index rather than to assess household economic well-being. While deemed easier to implement than income surveys in less developed countries where informality is widespread, the comparability of these estimates is affected by factors such as the length of the reference period considered, and of the list of items that households are asked to report.<sup>29</sup> These deficiencies led the Global Commission on Poverty to include developing a set of statistical standards for household consumption as one of its key recommendations (Atkinson, 2016).

Third, international guidelines on measuring the distribution of household *wealth* have yet to go through a similar process of convention-setting by an international body in charge of setting standards globally.<sup>30</sup>

Finally, even when measures exist on the distribution of household income, consumption and wealth, very few countries undertake these data collections in ways that would allow the joint distribution of household income, consumption and wealth to be analysed in a coherent way, which was one of the key recommendations of the Stiglitz-Sen-Fitoussi report.<sup>31</sup>

Even when international standards and guidelines exist, however, countries' data collections may adhere to them to different degrees, implying that some items are available and included in measured household income and consumption for some countries (e.g. imputed rents, taxes paid, and agricultural goods produced for own consumption) but not for others.<sup>32</sup> In the best of cases, the income or consumption concept reported in household surveys corresponds to what the Canberra convention would describe as "disposable income" and "final consumption expenditures", but not all countries are able to adequately measure these concepts.<sup>33</sup> Additionally, there is evidence that the problems related to unit nonresponse, item nonresponse and measurement errors in household surveys have increased over time (Groves et al., 2009; Meyer et al., 2015).

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<sup>29</sup> See Beegle et al. (2012).

<sup>30</sup> For its members in particular, the OECD produced guidelines in 2013, in response to the recommendations of the Stiglitz-Sen-Fitoussi Commission. The European Central Bank has also produced guidelines for members of the EU in the context of the implementation of the Euro System Household Finance and Consumption Survey.

<sup>31</sup> A framework for the joint analysis of micro-statistics on household income, consumption and wealth was released by the OECD in 2013 (OECD, 2013). An example of analysis of the joint distribution of income, consumption and wealth for the United States is provided by Fisher et al. (2016). An OECD-Eurostat Expert Group is currently working to develop experimental measures of inequality in the joint distribution on household income, consumption and wealth for around 25 countries.

<sup>32</sup> Beyond OECD countries, most income surveys do not report data on direct taxes paid by households. Around one-third of all OECD countries lack micro-data on wealth distribution, a proportion that is much higher for developing countries. Micro-data on consumption expenditures in OECD countries are rarely used for distributive analysis.

<sup>33</sup> See the proposed checklist to assess quality and comparability of data in Atkinson and Bourguignon (2015b).

Although there are countries for which long historical series on the distribution of wealth from a variety of administrative registries exist, survey-based data collections on the distribution of household wealth are much more recent than those for income, and the available data are significantly less comparable across countries, mainly on account of the different capacity of surveys to capture developments at the top end of the distribution. Wealth distribution data are available, with varying degrees of quality, for the United States (based on the Survey of Consumer Finances), the United Kingdom (based on the Wealth and Asset Survey), countries in the Euro-area (through the Household Finance and Consumption Survey coordinated by the European Central Bank), as well as for Australia, New Zealand, Canada, China, Indonesia, Norway, Korea, Japan, and Chile.<sup>34</sup> As discussed in the chapter by Deere, Kanbur and Stewart in the OECD publication “For good measure: advancing research on well-being metrics beyond GDP” (Durand et al., forthcoming), there are also a series of new initiatives to measure the distribution of wealth by gender. In the case of the distribution of wealth, survey estimates are even more likely to go wrong, simply because wealth is much more unequally shared than income, so that all the problems associated with the estimation of the shares of small groups of top wealth holders are exacerbated.

As stated, the overwhelming majority of inequality data has been based on household surveys. The Nordic countries, however, stand apart from other countries, due to their reliance on a well-developed system of registers that allow statistical offices to get information on personal income (and sometimes wealth) from various personal records, which are then combined into household files. While administrative records allow more precise information on people's economic resources to be obtained, and to link these resources for the same individual and sometimes across generations, these registers are far from perfect. An important downside is that they may only imperfectly match people belonging to the same household, and record members of the same household as separate households (e.g. students living away from the parental home for part of the year).

The distinction between survey-based and record-based methods is, moreover, becoming increasingly blurred, as several statistical offices in advanced countries have come to rely on mixed methods of data collection, whereby some of the information required by the survey is retrieved from administrative records (in most cases with the prior consent of the person being interviewed), or information from administrative records is used to identify groups of individuals that should be oversampled in the survey (as done by the Survey of Consumer Finances in the United States). While these mixed methods of data collection have proved effective in delivering higher quality information, their use is sometimes limited by statistical laws and administrative constraints. Obviously, the quality of statistical information provided by administrative registers depends on the quality of the registers (e.g. on how widespread tax evasion is), on the capacity of various administrations to link their records, etc.

An additional challenge for data on the distribution of household economic resources refers to the problems in reconciling the totals from micro data – i.e. consumption, income, and wealth totals from household surveys and administrative records – with those available through macro

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<sup>34</sup> Data on the distribution of household wealth, for 28 countries, are available through the OECD Wealth Distribution Database released in 2015. These data are sourced from national surveys, which may differ in significant aspects, and from register data from some Nordic countries.

data – i.e., totals for the (supposedly) same variables in the System of National Accounts. For most countries in the world, totals for household income and consumption from surveys do not match the equivalent totals from national accounts. These differences can be very large in some countries, as illustrated by Table 3 for a sample of Latin American countries.<sup>35</sup> Also, discrepancies are not limited to levels of different types of household economic resources but extend, more importantly, to their growth rates (Deaton, 2005). Gaps between macro and micro-statistics have been widening in many countries. While the causes of this pattern are not all well understood – and some of the discrepancy is probably due to the same problem of undercoverage and underreporting of top incomes mentioned above –, its very existence casts doubts on efforts to disentangle the relation between GDP growth and income distribution based on metrics that rely not only on different definitions of household income, but which may suffer from a series of measurement errors themselves. Diverging trends in income and consumption growth between household surveys and National Accounts have led to the creation of the OECD/Eurostat Expert Group on Integrating Disparities in National Accounts in Europe. The US Census Bureau and others in the United States are also trying to address this challenge.

**Table 3. Ratio of the mean income in household survey to the mean household final consumption expenditure per capita in National Accounts, selected Latin American countries**

Country	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Bolivia	1.26		1.07	1.01	1.08	1.08			1.17	1.19	1.17	1.21	1.27		1.26	1.27
Brazil				0.84	0.84	0.85	0.82	0.82	0.84	0.86	0.83	0.84	0.82		0.78	0.81
Colombia					0.50	0.67	0.60	0.63	0.66			0.65	0.68	0.71	0.71	0.67
Costa-Rica					0.80	0.79	0.80	0.75	0.76	0.75	0.80	0.80	0.90			
Dominican Republic				0.92	0.88	0.82	0.69	0.58	0.60	0.57	0.59	0.48	0.55	0.49	0.47	0.50
Ecuador				0.47			0.66	0.87	0.70	0.75	0.75	0.66	0.66	0.70	0.69	0.71
El Salvador								0.57	0.56	0.53	0.54	0.49	0.55	0.52	0.50	0.51
Honduras					1.13	0.93	0.95	0.96	0.91	0.92	0.98	1.03	1.03	1.01	0.98	
Mexico		0.44		0.49		0.47		0.43	0.43	0.43		0.43		0.42		0.44
Paraguay	1.44		1.34		1.32	1.22	1.26	1.15	1.18	1.08	1.07	0.98	1.10	1.06	1.06	0.00
Peru	0.74	0.81	0.81	0.70	0.67	0.76	0.71	0.72	0.67	0.72	0.75	0.73	0.77	0.78	0.76	0.77
Uruguay	0.76	0.80		0.83	0.82	0.76	0.71	0.70	0.70	0.69	0.69	0.71	0.82	0.74	0.73	0.70

Source: Bourguignon (2015b), Table 3.

One of the most important limitations of household surveys is that they underrepresent the rich and the poor, and underreport incomes at both ends of the distribution. Much of the current attention of researchers and statisticians has focused on the top end of the distribution. While this issue will be taken up in more detail in a later section of this paper, it should be stressed here that – as emphasized by Deaton (2005) – there can be no general supposition that estimated inequality will be biased either up or down in the case of “selective under-sampling”.<sup>36</sup> Issues of noncoverage, underrepresentation, and underreporting of the richest households become particularly relevant

<sup>35</sup> For example, according to Fesseau and Mantonetti (2013), in the case of Mexico, the adjusted national accounts total was more than seven times higher than micro total from the income and expenditures household survey.

<sup>36</sup> For a formal discussion, see Deaton (2005) p. 11. Also see Alvaredo, Atkinson and Morelli (2017), in the case of wealth. Deaton uses the term “selective under-sampling” while Jenkins (2015) calls it “underrepresentation”.



whenever much of the action concerning changes in the distribution is taking place at the top (as has been the case in many countries over the last decades) and is particularly problematic in very unequal societies, characterized by income and wealth highly concentrated in the hands of a small number of families.

The potential for mismeasurement is, however, not limited to the top end of the distribution but extend to the bottom end, as discussed in Atkinson (2016). Many poor people may not be adequately covered by existing measures, due to lack of a permanent address (e.g. the homeless), because they live in collective living quarters (e.g. slum-dwellers) or because they are recent arrivals in the country (e.g. refugees). Because of the undeclared and sometimes illegal nature of their activities, very poor people may also be unwilling to fully declare their income when asked in surveys. Many low-income people often report levels of consumption expenditures well in excess of their declared income, a factor which underscores the importance of joint analysis of income, consumption, and wealth to assess, for instance, whether the poor are “eating up” their assets.

While problems of underrepresentation and underreporting exist at both ends of the distribution, for inequality measures it is particularly relevant to correct the data for the missing rich, a topic that is discussed in the next section.

#### **5.4. The “missing rich” in household surveys<sup>37</sup>**

Whether they collect data on income, consumption or wealth, there is reason to believe that household surveys do not capture the rich well. How do we know that very high incomes are not captured in household surveys? Why is this issue important? What are its causes? What can be done to address the problem? Here I present a synthesis of the factors that give rise to the “missing rich” problem in household surveys, and review the approaches that have been proposed to deal with the problem.<sup>38</sup>

By inspection, one can observe that survey top incomes are at most close to the earnings of a well-paid manager; additionally, capital incomes as measured by surveys are a tiny fraction of what National Accounts identify as the amounts accrued to the household sector.<sup>39</sup> The fact that rich individuals are largely missing in household surveys may explain in part the worrisome result that, especially in middle and low-income countries, the survey-based measure of per capita household income (or some of its components) or consumption frequently show levels substantially lower than the per capita household income or consumption from National

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<sup>37</sup> This section is based on Lustig (forthcoming) “The ‘Missing Rich’ in Household Surveys: Causes and Approaches to Correcting for It”, CEQ Working Paper 75 (Commitment to Equity Institute, Tulane University). The author is very grateful for the invaluable comments on this section from Francois Bourguignon, Sharon Christ, and Marco Mira d’Ercole.

<sup>38</sup> Regardless of its cause, I will call the issue at hand the “missing rich” problem. Other terminology has been used. Jenkins (2015), for example, refers to the problem as “under-coverage” of the rich.

<sup>39</sup> See Alvaredo and Londoño-Velez (2013) for Colombia; Jenkins (2015) for the United Kingdom; Szekely and Hilgert (1999) for Latin American countries.

Accounts<sup>40</sup> or tax records.<sup>41</sup> The missing rich problem may explain as well why there are striking discrepancies in inequality levels and trends, depending on the source of the data (e.g., surveys vs. tax records).<sup>42</sup> If the rich are missing, the survey-based distributions of income, consumption or wealth, and the concomitant inequality measures should be viewed with caution: actual inequality may be considerably different than survey estimates.<sup>43</sup> As discussed below, however, it is not necessarily true that correcting the information for the rich that are missing will necessarily result in higher inequality.

The most obvious reason why the rich, especially the ultra-rich, are missing in household surveys is because there are very few of them in the target population. Thus, the probability of including one of these individuals in a survey (sample) is rather low. As discussed in Lustig (2018c) there are, essentially, five additional factors embedded in the data collection process that may give rise to the missing rich problem in household surveys: 1) frame or noncoverage error; 2) unit nonresponse; 3) item (income) nonresponse; 4) underreporting; and 5) top coding and trimming. Surveys may suffer from one or any combination of problems 1-5, and any one of them can potentially result in an underestimation of the income share of the top income fractile. In addition, as mentioned above, even if there is full coverage and response rate, no underreporting, and no top coding or trimming, rich individuals may not appear in household surveys due to sparseness: i.e. there is no density mass at all points of the upper tail of the true distribution's support, especially for extreme values.<sup>44</sup> Sparseness or low frequency of observations at the top will result in a frequent underestimation of the income share of rich individuals but, on occasion, the income share may be overestimated.

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<sup>40</sup> See the pioneering work on this by Altimir (1987).

<sup>41</sup> See, for example, the chapter by Alvaredo et al. in the OECD publication "For good measure: advancing research on well-being metrics beyond GDP" (Durand et al., forthcoming).

<sup>42</sup> See Alvaredo and Londoño (2013), Alvaredo et al. (2015); Belfield et al. (2015); Burrell (2012).

<sup>43</sup> The "Report of the Commission on Global Poverty" (Atkinson, 2016) includes a thorough discussion of these problems at the bottom of the distribution and recommendations on how to deal with them. Here we shall concentrate on the various approaches that have been proposed to address similar problems but at the other end of the distribution, i.e. the high incomes group or the so-called rich.

<sup>44</sup> Put differently, the probability that Warren Buffett or Bill Gates are selected in a sample in US household surveys or Carlos Slim in a Mexican household survey, is negligible.

In the presence of any of the sampling and nonsampling problems described above, survey-based inequality measures will be biased. The direction of the bias in inequality measures can be positive or negative, as use of the corrected data will affect both what happens at the top but also on how correcting for the missing rich problem affects the mean (Deaton, 2005).<sup>45</sup> Even if there are no errors in the achieved sample that led to biased inequality estimates, sparseness in the upper tail can result in volatile inequality estimates. If the rich are selected in the sample with a very low frequency, the survey-based inequality measures will frequently be below the true inequality measure and above it on occasion.<sup>46</sup>

A variety of approaches have been proposed in statistics and in the measurement of inequality literature to address the missing rich problem.<sup>47</sup> In terms of the data sources used, these can be classified into three broad groups: alternate data: relying on alternative data such as tax records instead of surveys; within survey corrections: correcting the surveys using parametric and nonparametric methods; survey-cum-external data: correcting survey data (or inequality estimates) by combining surveys and administrative data (National Accounts and tax records) using parametric and nonparametric methods.

A key distinction among existing methods is whether they correct the data by *replacing* incomes at the top by fitting a model or using external information (e.g. tax records); or changing the weights of the “rich” and “nonrich” population, i.e. *reweighting* or poststratification. The first approach assumes that the population shares of top incomes (the rich) and the rest (the non-rich) in the achieved sample survey are correct, and that the problem lies in that the incomes captured at the top are incorrect. This can occur either because the incomes in the survey are underreported or because the individuals captured by the survey are not really representative of the rich (due to undercoverage, underrepresentation, top coding, and/or sparseness). The second correction category assumes that the population weights for the rich and non-rich in the sample are incorrect: one must “add people” at the top. Under the replacing and reweighting approaches, there exist a variety of methods. Table 4, drawn from Lustig (2018c), presents a summary of the correction approaches and refers the reader to a sample of their applications.

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<sup>45</sup> As Deaton (2005) puts it “...with greater nonresponse by the rich, there can be no general supposition that estimated inequality will be biased either up or down by the selective undersampling of richer households. (The intuition that selective removal of the rich should reduce measured inequality, which is sometimes stated as obvious in the literature, is false, perhaps because it takes no account of reduction in the mean from the selection)” (p. 11). A simple example can illustrate this point. Let’s assume that we observe a population of 4 people, with the first three having \$0 income and the fourth \$1 (0,0,0,1). The coefficient of variation for this distribution is 2 and the share of income of the richest person is 100%. Let’s now assume that one “rich” person is missing, so that the true distribution is (0,0,0,1,1): in this case, the coefficient of variation is 1.37 and the income share of the richest person is 50%, i.e. inequality is lower when the sample is corrected to fully capture the top end of the distribution.

<sup>46</sup> See, for example, Higgins, Lustig and Vigorito (2017).

<sup>47</sup> Cowell and Flachaire (2015), classify the (right-) tail errors into two main types of “data problems”: *measurement error and data contamination*; and *incomplete data*. Their paper discusses a variety of methods to address them.

**Table 4. Approaches to Address the Missing Rich Problem in Household Surveys**

Approach	Survey Data	Administrative Data	References
<b>Panel A: TAX DATA ONLY</b>			
Tax data from individual records or tabulations are used to calculate the income shares of top incomes (e.g., the emblematic 1%)	Not used	Yes: Tax Records (individual records and tabulations)	Atkinson and Harrison (1978); Atkinson and Piketty (2007, 2010); Kuznetz (1953); Piketty (2001); Piketty and Saez (2003)
<b>PANEL B: WITHIN SURVEY CORRECTION METHODS</b>			
<b>B.i REPLACING TOP INCOMES: POPULATION SHARES (WEIGHTS) OF TOP INCOMES (<math>\beta</math>100%) AND NONTOP INCOMES <math>[(1 - \beta)100\%]</math> UNCHANGED</b>			
Semiparametric methods: Pareto distribution (or other models) for top ( $\beta$ 100%) incomes and survey data for nontop $[(1 - \beta)100\%]$	Yes	Not used	Methodology: Cowell and Victoria – Feser (1996); Cowell and Flachaire (2015) Application: Alfons, Temple, & Filzmoser (2013); Burkhauser et al. (2012); Cowell and Flachaire (2007); Hlasny and Verme (2017); Ruiz and Woloszko (2015)
Imputation methods: parametric (regression imputation) and nonparametric (e.g., hot deck) -	Yes	Not used	Methodology: Little and Rubin (2014) Application: Autor et al. (2008); Burkhauser, Feng, and Larrimore (2010); Campos-Vazquez and Lustig (2017); Jenkins et al. (2011); Lemieux (2006)
<b>B.ii: REWEIGHTING: POPULATION SHARES (WEIGHTS) OF TOP INCOMES (<math>\beta</math>100%) AND NONTOP INCOMES <math>[(1 - \beta)100\%]</math> CHANGE</b>			
Poststratification: replace the expansion factors in sample by new weights generated with information on respondents obtained from survey producers.	Yes	Not used	Methodology: Atkinson and Micklewright (1983); Biemer and Christ (2008); Korinek, Mistiaen, and Ravallion (2006); Mistiaen and Ravallion (2003) Application: Hlasny and Verme (2017)
<b>PANEL C: COMBINING SURVEY AND ADMINISTRATIVE DATA</b>			
<b>C.i REPLACING TOP INCOMES: POPULATION SHARES (WEIGHTS) OF TOP INCOMES (<math>\beta</math>100%) AND NONTOP INCOMES <math>[(1 - \beta)100\%]</math> UNCHANGED</b>			
<b>C.i.a Combining Data</b>			
<b>Nonparametric</b>			
Replace the survey-based mean incomes for pre-specified fractiles (e.g. percentiles) by tax data cell-means; cut-off at which replacement takes place varies	Yes	Yes: Tax Records	Alvaredo et al. (2017a); Bach et al. (2009); Burkhauser et al. (2016); Campos and Lustig (2017); Dept for Work & Pensions (2015)
Adjust to National Accounts: capital incomes of top $\beta\%$ in survey are grossed-up to match total income from capital in National Accounts. (Method also grosses up labor income)	Yes	Yes: National (Household Income) Accounts	Methodology: Altimir (1987) Application: CEPALStat (UN Economic Commission for LAC) until 2016
<b>Semiparametric</b>			
WID.World Approach: Assume survey below percentile $\beta'$ (e.g., 0.9) is reliable; replace by tax data above percentile $\beta$ (e.g.,.995 percentile); assume quantile ratio upgrade factor rises linearly in between $\beta'$ and $\beta$ (interpolation to “join” both distributions); if data comes in form of tabulations, apply generalized Pareto (Blanchet, Fournier, and Piketty, 2017); add tax-exempt capital income (undistributed profits); gross-up to national accounts totals.	Yes	Yes: Tax Records (tabulations) and National Accounts	Methodology: Alvaredo et al. (2017b and c)  Applications: Garbinti, Goupille and Piketty (2017); Novokoment, Piketty, and Zucman (2017); Piketty, Saez and Zucman (2016); Piketty, Yang and Zucman (2016)
<b>C.i.b Combining Inequality Estimates</b>			
Calculate total inequality using inequality decomposition formula: sum of inequality within top, inequality within bottom, and inequality between. That is, estimate Gini for top ( $\beta$ 100%) with tax data; estimate the Gini for bottom $(1 - \beta)100\%$ based on survey; apply decomposition formula (Atkinson, 2007) and Alvaredo, 2011) to estimate total Gini	Yes	Yes: Tax Records	Alvaredo (2011); Alvaredo and Londoño (2013); Atkinson (2007); Atkinson, Piketty, and Saez (2011); Diaz-Bazan (2015); Jenkins (2017), Lakner and Milanovic (2016)



**Table 4. Approaches to Address the Missing Rich Problem in Household Surveys (cont.)**

C.ii: REWEIGHTING: POPULATION SHARES (WEIGHTS) OF TOP INCOMES ( $\beta$ 100%) AND NONTOP INCOMES ( $(1 - \beta)$ 100%) CHANGE			
<b>C.ii.a Combining Data</b>			
Poststratification: replace the expansion factors in sample by new weights from administrative sources (e.g., social security records). Use information from external “donors” to generate new weights	Yes	Yes: Tax Records	Methodology: Biemer and Christ (2008) Application: Campos and Lustig (2017)
Poststratification: reweight so as to be “close” to survey-based distribution below a certain income threshold and “close” to tax-based distribution above that threshold	Yes	Yes: Tax Records	Bourguignon (2017b)
<b>C.ii.b Combining Inequality Estimates</b>			
Poststratification: Calculate total inequality using inequality decomposition formula: sum of inequality within top, inequality within bottom, and inequality between, but assume survey represents only bottom share of population. That is, assume survey data is the $(1 - \beta)$ 100% instead of 100%; estimate the Gini for redefined bottom $(1 - \beta)$ 100%; estimate Gini for top ( $\beta$ 100%) with tax data; and apply Atkinson (2007) and Alvaredo (2011) formula to estimate total Gini	Yes	Yes: Tax Records; rich lists (e.g., Forbes)	Methodology: Atkinson and Bourguignon (2000) Applications: Anand and Segal (2015)

Note: The “mapping” of studies to methods under the “References” column should be viewed as an approximation because studies frequently apply more than one method.

Source: *Source*: Lustig (2018c), “The Missing Rich in Household Surveys: Causes and Correction Methods”, CEQ Working Paper 75, Commitment to Equity Institute, Tulane University, Table 1.

### 5.5. Broadening the indicator of households' economic well-being

There is a long-standing discussion, among economists and statisticians, about the best metric to describe people's economic well-being. One perspective, articulated by Stiglitz, Sen and Fitoussi (2009), is that, ideally, one would like to focus on the distribution of consumption *possibilities* across people, socio-economic groups and generations. While income flows and wealth holdings are an important gauge for assessing power relations within a community, a narrower economic view is that what really matters for people's economic well-being is what they are potentially able to consume over time – including across generations.

Consumption possibilities are determined not only by current earned income but also by accumulated wealth and by the ability to borrow against existing wealth or future savings. Wealth is an important indicator of the sustainability of observed consumption: for a given income, consumption can be raised by running down assets or by increasing debt. Similarly, savings and additions to assets reduce consumption for a given level of income. In addition to earned income flows and wealth, consumption possibilities are determined by transfers between households (e.g., gifts, remittances, and inheritance) and within them (e.g., from income earners to other members).

Consumption possibilities are also determined by state action. Subtracting direct taxes (e.g., personal income and wealth taxes) and social security contributions paid by workers, and adding current transfers provided by governments and non-profit institutions (e.g., cash transfers to the poor or to people unable to work) to earned and unearned income yields *disposable income*. Disposable income at any point in time, however, does not capture consumption possibilities accurately. A better indicator of the latter is *final consumption expenditures*, equal to disposable income plus consumption financed by borrowing or by drawing down assets and less saving. In practice, however, measured *final consumption expenditures* do not capture consumption

possibilities accurately either. For example, the benefits from consumer durables other than housing are typically recorded when expenditures are incurred, rather than over the longer period when these benefits are provided. In some instance, to avoid distortionary spikes in consumption expenditures, spending on consumer durables other than housing is not included at all. Additional limitations occur when specific types of difficult-to-measure flows (such as imputed rents, i.e. the income that accrues to property owners from the dwellings that they own; or the value of goods produced by households for own consumption, which are important in countries with large subsistence farming) are excluded.

In this section, however, we would like to draw attention to two elements that are typically excluded from the conceptual definitions of household income and expenditures that are conventionally used in analysis of economic inequalities: free in-kind services (especially, education and healthcare) provided to households by governments and non-profit institutions; and consumption taxes and subsidies.<sup>48</sup>

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<sup>48</sup> These concepts and how they affect households' incomes are discussed in detail in Lustig (2018a).

### *Social transfers in kind*

In addition to earned income and cash transfers, households receive benefits in-kind such as education, health care, and social housing that governments provide to households for free (or at a highly subsidised prices), and whose provision is financed out of taxes (and often user fees or other forms of direct payments made by the user of such services). Including these in-kind benefits in measures of household income and consumption is important, for example, to avoid that reductions in direct taxes, offset by lower provision of these government services, lead to higher measures of people's economic welfare simply because the concomitant reduction in public services has not been recorded. Adding the value of those services – also called *social transfers in kind* – to household income and consumption provides, in theory, a better measure of households' consumption possibilities. However, there is no consensus on how to make these imputations; there are also concerns that such imputations may lead to metrics that are further away from what people actually experience.<sup>49</sup>

Valuing social transfers in kind raises both conceptual and measurement challenges. Decisions are needed in terms of the range of services to be considered (ideally, all types of individualised services provided by governments and non-profit institutions, excluding public goods such as defence or law and order); the monetary valuation of the services provided; and their allocation to various beneficiaries.<sup>50</sup>

In practice, the most frequently used approach is to value in-kind transfers at the production costs incurred by the government in producing them (Lustig, 2018a). For education, the method most commonly used consists of attributing a value to an individual who attends public school, using values equal to the per-beneficiary input costs obtained from administrative data, and adding this value to the household's income. For example, average government expenditure per primary school student obtained from administrative data is allocated to the households based on how many children are reported attending public school at the primary level (the same method applies to other levels of schooling). Information on whether school-age children are attending public or private school, or whether they are in school at all, may not be collected in income and consumption surveys, so that general allocation based on the age of children may fail to identify the true beneficiaries or allocate to them a benefit that they never received.

Imputation to individual users is even more complex in the case of health care. In this case, the allocation of benefits is done following either the 'actual consumption approach' or the 'insurance value approach'. As described in Higgins and Lustig (2018), the first approach allocates the value of public services to the individuals who are actually using the service. The second approach assigns the same per capita spending to everybody sharing the same characteristic such as age or gender, irrespectively of their actual use of these services, based on the principle that all people with the same demographic characteristics are entitled to these public benefits. The reliance on one approach over the other depends, often, on data availability but the choice also raises conceptual problems, as well as leading to very different empirical results. To impute the value received from public health services based on actual consumption, the household survey must provide information about the use of health services, and distinguish between public care (which is usually received from the

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<sup>49</sup> United Nations Economic Commission for Europe (UNECE, 2011).

<sup>50</sup> The options are summarized by Bastagli (2005), p.12.



public health system or paid for by public health insurance schemes) and private care. In the absence of information about whether the care received was subsidised by government, a survey may ask about whether the patient is covered by private insurance. Patients who received health care and report having private health insurance are considered to have received private care, and thus received no in-kind transfer, while patients who report not having private health insurance are considered to have received public care. Ideally, the survey should also contain one or more questions about the type of service received.<sup>51</sup> Attributing health-care services to users also implies making sick people "richer" than they would otherwise have been, while also raising the issue of whether allowance should be made for their higher needs, which are ignored by the equivalence scales typically used in analysis.

In sum, the approach to valuing the benefits of public education and health-care services amounts to asking the following question: how much would the income of a household have to be increased if it had to pay for the free or subsidised public service (or the insurance value in the cases in which this applies to health-care benefits) at the full cost to the government? The conventional answer to this question is to look at production costs. This approach, however, raises a number of issues: it does not take into account variations in needs across income or age groups, nor does it consider service quality, and may not reflect the actual valuation by beneficiaries.<sup>52</sup> Teachers may not show up at local schools, and the quality of the schooling services provided may be a fraction of what households could deem as adequate given the amount of taxes that they have paid. Distributional analysis of in-kind transfers may reveal that poorer households gain larger shares of particular categories of public spending than higher-income households. However, this result may be due to the fact that the middle-classes and the rich opt out of public education and healthcare because of their poor quality. Given the limitations of available data, however, the cost of provision method is the best one can do for now.<sup>53</sup>

### *Taxes and subsidies on consumption*

A second element that is typically excluded from assessments of people's consumption possibilities is the impact that consumption taxes and production subsidies have on what — following the naming convention established in the Commitment to Equity Project — we can call "consumable income", i.e. the *actual* consumption of goods and services by people.<sup>54</sup> To illustrate this point, let's consider two countries (or the same country but at two points in time) and assume

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<sup>51</sup> For more details, see Higgins and Lustig (2018).

<sup>52</sup> Atkinson and Bourguignon (1990); OECD (2015); Sahn and Younger (2000). By using averages, this approach ignores differences across income groups and regions. For example, governments may spend less (or more) per pupil on poorer students. We recommend averaging at as disaggregated a level as possible (not only by education level but also by state and rural/urban area within states, for example). The level at which it is possible to disaggregate will depend on data from national accounts. Data obtained from the education ministry is likely to be more disaggregated than that obtained from other national accounts.

<sup>53</sup> Barofsky (2018) describes the pros and cons of three methods that can be used to value the distributional impact of health care spending: average cost, behavioral-outcome approach, and willingness to pay. His conclusion is that all the methods have their pros and cons: they provide different types of information and, as such, should be used as complements rather than substitutes.

<sup>54</sup> See Lustig (2016). Consumable income in the CEQ project is defined as disposable income net of indirect taxes and subsidies. In other contexts, consumable has been referred to the income subject to consumption taxes (Ebel and Petersen, 2012). For more on the CEQ project, visit [www.commitmenttoequity.org](http://www.commitmenttoequity.org).

that final consumption expenditures are the same in the two cases, but that in one the Value Added Tax is 10% while in the other it equals 20%. Obviously, for a given amount of money income, what households can actually consume will be higher in the first case than in the second.

Consumption taxes can increase poverty. In a sample of 28 low- and middle-income countries, the Commitment to Equity project found that for Armenia, Bolivia, Ethiopia, Ghana, Guatemala, Honduras, Nicaragua, Sri Lanka, and Tanzania, the headcount poverty for consumable income, based on a poverty line of USD 2.50 per day (in 2005 PPP), is *higher* than the headcount for market income (before personal income and consumption taxes, cash transfers, and consumption subsidies), i.e. consumption taxes increase the prevalence of income poverty. In Ghana, Nicaragua, and Tanzania, net payers to the fiscal system begin in the income range USD 0-1.25/day in purchasing power parity (i.e. the ultra-poor) when consumption taxes are included. In Guatemala, Ethiopia and Armenia, net tax payers begin in the income group of extreme poor with USD 1.25-2.50/day. In Sri Lanka, Peru, El Salvador, Dominican Republic, Honduras and Bolivia, net payers to the fiscal system begin in the income category USD 2.50-4/day, i.e. in the group classified as moderately poor.<sup>55</sup>

Beyond these effects on the absolute level of consumption, consumption taxes may also impact on distribution. When annual income is used as a measure of economic well-being, consumption taxes are regressive, i.e. relatively more of them is paid by low-income groups of the population as poor people spend a greater share of their income on consumption than rich people. Conversely, when life-time income is used as metric of economic well-being, consumption taxes could be proportional (or even progressive), under the assumption that today's savings will be spent on consumption goods in the future. Even in a life-course perspective, however, consumption taxes may have regressive effects when considering that accumulated savings may be used to finance the future purchase of capital goods (e.g. housing) rather than consumption goods, that this purchase may be effected abroad rather than domestically, that different consumption goods may be subject to different levies, and that the structure of consumption may differ across the income distribution. In all these cases, consumption taxes will have redistributive effects which are generally ignored by studies of fiscal redistribution, in addition to those operating through the general level of prices.

While it is acknowledged that household consumption possibilities are reduced/increased by consumption taxes/production subsidies passed on to the prices households pay for goods and services, taking this impact into account has not been part of the conventions typically used for analysing disparities in households' economic well-being.<sup>56</sup>

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<sup>55</sup> These results are based on the CEQ Institute studies and are summarized in Lustig (2018b). Also, see Higgins and Lustig (2016) for estimates of the extent of fiscal impoverishment that taxes (net of transfers and subsidies) can generate and how to measure this phenomenon formally. Consumption subsidies work in the opposite direction.

<sup>56</sup> The 2011 *Canberra Group Handbook* stated that: "...ideally all indirect taxes that can be attributed in some way to individual households should be included in any comprehensive analysis of the effects of government benefits and taxes on the distribution of household income. This includes not only consumption taxes on final expenditure of households, but also taxes on inputs into the production process of goods and services" (UNECE, 2011, pp. 47-48) See also Table 2.1 (p. 18) of the same report as well as Zwijnenburg, Bournot and Giovannelli (2017).

## 5.6. Conclusions

Since the turn of the XXI<sup>th</sup> century, both policy-makers and the public at large have paid growing attention to the distribution of household economic resources. This has been accompanied by a growing number of micro-data sets becoming available in individual countries (notably on wealth), a growing focus on the top end of the distributions, the mobilisation of additional data sources such as tax records, steps to bring closer together macro and microdata streams, and a growing attention to the "global distribution of income", which has led to the construction of large international dataset combining information from different national sources. These developments have changed significantly the landscape compared to as recently as 2009, when the report of the Stiglitz, Sen and Fitoussi "Commission on the Measurement of Economic Performance and Social Progress" was published. In particular, returning to the use of tax data and, especially, combining them with data from (income and wealth) surveys and from national accounts, has generated a number of seminal contributions, and helped focus attention on top incomes in an unprecedented manner.<sup>57</sup>

While there has been progress, major issues remain in achieving the goal of measuring the distribution of household economic resources across countries and over time. Different international datasets feature important discrepancies in terms of both levels and changes of inequality for the same country and time period; inconsistent narratives on inequality levels and trends among micro and macro sources are notable and, in some cases, have become larger over time; inequality indicators tend to reflect only partially the true extent of inequality due to the underreporting and noncoverage of rich individuals in household surveys; measuring the correct income concept is still challenging; international conventions remain incomplete; and, data on wealth inequality, while more common than before, still remain scarce.

In this context, a number of recommendations are put forward.

- *Defining and measuring a more comprehensive income concept.* As discussed above, more analytical and empirical work is needed to accurately reflect in a broader income concept the value of in-kind benefits such as education and health care services provided to households by governments and non-profit institutions. In addition, the measurement of consumption possibilities must consider the impact of the services that household produce for their own consumption as well as of consumption taxes and subsidies. The international convention proposed by the *Canberra Group Handbook* acknowledges the need to broaden the conceptual definition of household income to consider benefits in kind but remains silent on how to achieve this in practice, while excluding both household services produced for own use and consumption taxes and subsidies. This needs to change, in ways that do not compromise the quality and comparability of existing measures of other income streams. This could be achieved by complementing existing measures of household disposable income (which largely follow international guidelines) with experimental measures based on broader concepts (e.g. measures that integrate the value of benefits in kind, services produced by households for their own use, and consumption taxes). Clearly, consumption possibilities are different depending on, for example, VAT rates: two

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See the fairly long list of finished and ongoing studies featured in the WID website and the studies they cite in turn.

individuals with the same disposable (or adjusted final income, for that matter) but with different structure of their consumption expenditure would have different consumption possibilities when the VAT rates applied to different goods and services differ.

- *Correcting for underreporting and noncoverage of the rich.* Assessing the extent to which there is underreporting at the top (and bottom) end of the distribution and whether rich (and poor) people are “missing” from income, consumption and wealth distributions should be a common practice in the measurement of economic inequality. “Rich lists” (reporting the number and the income/wealth values of very wealthy individuals and households) exist for many countries, and tax records (when of good quality) provide an important resource for implementing that correction. Proposals for adjustments, where appropriate at the national level, for underrepresentation and noncoverage by surveys should be made. All of this will require considerable investment in improving and developing statistics. Of prime importance is for governments to make the information from (anonymised) tax records available and allow for the linking through personal identification numbers between surveys and registries.<sup>58</sup> The scholarly community working on inequality should undertake a thorough and systematic assessment of the various methods to contend with underreporting and noncoverage, and come up with recommendations of best practices, including some key robustness checks.
- *Increasing the availability of data on the distribution of wealth.* There are a series of sources to obtain information on the distribution of wealth: dedicated household surveys on wealth; administrative data on investment income, capitalised to yield estimates of the underlying wealth; lists of large wealth-holders, such as the annual Forbes Richest People in America List, or the Sunday Times Rich List for the UK; population censuses, which in some cases and years included questions on household wealth; administrative data on individual estates at death, multiplied-up to yield estimates of the wealth of the living; and administrative data on the wealth of the living derived from annual wealth taxes. Greater international efforts should be devoted to assess the availability and quality of data on wealth distribution and make recommendations so that the necessary data are periodically collected in as many countries as possible, and in ways that make the information comparable across countries and over time.
- *Addressing inconsistencies in international datasets.* Growing interest in the “global distribution” of income or wealth (i.e. the distribution that would obtain when all people of the world are considered as citizens of the same country) has recently led to the proliferation of international datasets combining information from a large array of national sources. While the quality of these datasets is generally a function of the underlying national data, the agencies and researchers initiating these datasets often make various assumptions to fill data gaps or to increase the ex post comparability of these estimates. Even when these international datasets are limited to parts of the world where country-level data are more readily available, different data-treatments applied to national data and differences in data-collections (across countries and over time) may not be visible to users. Given that global inequality analyses are so sensitive to the choice of database, dataset

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The Uruguayan government has taken such a step and shared this type of information with academics. See Higgins, Lustig, and Vigorito (2017).

users should acquire a thorough understanding of the assumptions and methodological choices embodied in the data they are about to use, and undertake systematic robustness checks to determine if their results are sensitive to the use of a particular dataset. Dataset producers should document all assumptions clearly and thoroughly; make the data, programmes and results publicly available to allow for replicability whenever it applies; compare their methods and results with one another and, eventually, agree on conventions and best-practice when calculating inequality indicators from microdata, secondary, and imputation-based sources. Finally, the international community should devote greater financial resources to allow poorer countries to put in place the statistical infrastructure that is needed to fill the gaps and provide the information needed to gain a better understanding of national and global inequalities. Providing a better picture of the global income distribution has the nature of a global public good (needed, for example, to assess the impact of globalisation on people in all countries of the world), implying that rich countries should provide part of the resources needed for this to happen.

- In line with one of the main recommendations of the *Global Poverty Report*, an international organisation should take the lead in setting up a standing Statistical Working Group on economic inequality, with a remit to set guidelines for the measurement of household income, consumption, and wealth, to examine the relation between the three, and to investigate the relation between household survey, national accounts, tax records and other data sources and how consistency among them can be enhanced. The latter would be important to tackle the issue of sometimes severely inconsistent narratives among sources on inequality levels and trends.
- *To integrate or not to integrate?* Undoubtedly, the life of users of economic inequality data would be made much easier by the existence of one integrated data-source on the distribution of household income, consumption and wealth, compiled from various sources: household surveys, administrative registries, statements provided by financial institutions, and national accounts. However, we are still far away from this ideal: individual data-sources are compiled with different goals, based on different conventions and definitions. The assumptions made by national accounts statisticians when integrating counterpart information from various institutional sectors may be less palatable to survey statisticians. While several initiatives are currently underway in developed countries (both to integrate micro- and macro-statistics for the household sector, and to integrate various types of micro-statistics), in low and middle income countries the questions about the quality of data makes integration exceedingly difficult. When survey income aggregates are between 40% and 60% of National Accounts aggregates, for instance, one wonders whether the problem is really the existence of underreporting and noncoverage in the surveys or rather with the accuracy of National Accounts. In such a context, there is considerable value in a multi-source approach to investigate the distribution of income, consumption and wealth. No single method is sufficient on its own, and it is necessary to draw attention to their strengths and weaknesses.<sup>59</sup> In these situations, rather than choosing one alternative, one should probably pursue both the integrated data approach as well as the dashboard approach (Bourguignon, 2016). The dashboard approach would entail reporting estimates from household surveys and tax data (and possibly other distribution

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See Alvaredo, Atkinson and Morelli (2016).

data) separately as they describe different segments of the distribution; integrating both through, for example, the DINA (Distributional National Accounts) methodology described in the chapter by Alvaredo et al. the forthcoming OECD publication “For good measure: advancing research on well-being metrics beyond GDP” (Durand et al., forthcoming), as well as other methods described above; and use National Accounts and other administrative data to investigate the sources of inconsistency and to assess their implications for the inequality results.

Addressing all these issues will require more investment of resources (both financial and intellectual) on the part of governments, statistical offices, multilateral organisations, philanthropic foundations and researchers alike. It will also require cooperation among these constituencies to generate international conventions where they lack, and implementation guidelines where needed. Finally, accurate measurement of economic inequality will require a political commitment. Governments, international organisations and the scholarly community need to be committed to transparency and to make information publicly available in ways that facilitate the measurement and analysis of economic inequality while protecting the identity of respondents to preserve confidentiality.

One final word. While the discussion here has emphasized the shortcomings, problems, and limitations of existing statistics on economic inequality, we have adopted in this paper the same view underpinning the *Report of the Commission on Global Poverty*. We should be aware of the uncertainty that surrounds inequality indicators, and be conscious that both levels and changes in inequality are measured with a considerable margin of error. Different sources are however affected by different problems and biases, and by crossing different perspectives and information sources we can get a better and richer understanding of the underlying reality. Hence, rather than taking the position that nothing can be said, we want to encourage the research and statistical communities to identify different potential sources of error, to develop methodologies to address these problems, and to attach an indication of their possible size, as well as propose ways to introduce more robustness in measuring such a crucial indicator as the extent of economic inequality and how it changes over time.<sup>60</sup>

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<sup>60</sup> Atkinson, 2016, p. 15.

## References

- Aaberge, R. and A. Brandolini (2015), "Multidimensional Poverty and Inequality". Chapter 3 in Atkinson, A. B. and F. Bourguignon (eds.), *Handbook of Income Distribution*, Vol. 2, North-Holland, Elsevier, Amsterdam.
- Aaberge, R., M. Mogstad and V. Peragine (2011), "Measuring Long-term Inequality of Opportunity," *Journal of Public Economics*, 95 (3), pp. 193-204.
- Acemoglu, D., S. Naidu, P. Restrepo and J. Robinson, (2013), "Democracy, redistribution and inequality," Working Paper 19746, National Bureau of Economic Research, December.
- Acemoglu, D., S. Naidu, P. Restrepo, J. Robinson, (2015), Chapter 21 in Atkinson, A. and F. Bourguignon (eds.), *Democracy, Redistribution, and Inequality*, North-Holland, Elsevier, Amsterdam.
- Afkar, R., J. Jellema and M. Wai-Poi (2017), "The Distributional Impact of Fiscal Policy in Indonesia," Chapter 5 in Inchauste, G. and N. Lustig (eds.), *The Distributional Impact of Taxes and Transfers. Evidence from Eight Low- and Middle-Income Countries*, The World Bank, Washington, D.C.
- Akerlof, G. and R. Kranton (2000), "Economics and Identity", *Quarterly Journal of Economics*, 115 (3), pp. 715-53.
- Alfons, A., Templ, M. and Filzmoser, P. (2013), "Robust estimation of economic indicators from survey samples based on Pareto tail modelling", *Journal of the Royal Statistical Society*, 62 (C), pp. 271–86.
- Altimir, O. (1987), "Income Distribution Statistics in Latin America and their Reliability," *Review of Income and Wealth*, Vo. 33, Issue 2, June, pp. 111-155.
- Alvaredo, F. (2011), "A Note on the Relationship Between Top Income Shares and the Gini Coefficient," *Economics Letters*, 110 (3), pp. 274-277.
- Alvaredo, F. and L. Gasparini (2015), "Recent Trends in Inequality and Poverty in Developing and Emerging Countries," Chapter 9 in Atkinson, A. B. and F. Bourguignon (eds.), *Handbook of Income Distribution*, Vol. 2, North-Holland, Elsevier, Amsterdam.
- Alvaredo, F. and J. Londoño-Velez (2013), "High Incomes and Personal Taxation in a Developing Economy: Colombia 1993-2010", CEQ Working Paper 12, Center for Inter-American Policy and Research and Department of Economics, Tulane University and Inter-American Dialogue, March. [http://www.commitmentoequity.org/publications\\_files/CEQWPNo12%20HighTaxationDevEconColombia1993-2010\\_19March2013.pdf](http://www.commitmentoequity.org/publications_files/CEQWPNo12%20HighTaxationDevEconColombia1993-2010_19March2013.pdf)
- Alvaredo, F., A. B. Atkinson and S. Morelli (2016), "The Challenge of Measuring UK Wealth Inequality in the 2000s", *Fiscal Studies*, 37 (1), pp. 13-33.
- Alvaredo, F., A. B. Atkinson and S. Morelli (2017), "Top Wealth Shares in the UK Over More than a Century", Research Paper Series 01, Department of Economics, University Ca' Foscari of Venice, January, <https://ssrn.com/abstract=2903853>
- Alvaredo, F., A. B. Atkinson, T. Piketty and E. Saez (2013), "The Top 1% in International and Historical Perspective", *Journal of Economic Perspectives*, 27 (3), pp. 3-20.

- Alvaredo, F., R. Campos-Vazquez, S. Garriga, and M. F. Pinto (2017a), “Household Surveys, Administrative Records and National Accounts in Mexico 2009-2014. Is a Reconciliation Possible?”, Powerpoint Presentation, LACEA Annual Meeting, Buenos Aires, November 11.
- Alvaredo, F., A. B. Atkinson, T. Piketty, E. Saez and G. Zucman (2015a), "The World Top Incomes Database", <http://wid.world/wid-world/>
- Alvaredo, F., A. B. Atkinson, T. Piketty, E. Saez and G. Zucman (2015b), "The World Wealth and Income Database-WID", <http://www.parisschoolofeconomics.eu/en/research/data-production-and-diffusion/the-world-wealth-income-database>.
- Alvaredo, F., L. Chancel, T. Piketty, E. Saez and G. Zucman (forthcoming), “Distributional National Accounts in the Context of the WID.World Project”, chapter in M. Durand, J-P. Fitoussi and J. E. Stiglitz (eds.), *For Good Measure: Advancing Research on Well-Being Metrics Beyond GDP*, OECD report by the High Level Expert Group on Measuring Economic Performance and Social Progress, OECD Publishing Paris.
- Alvaredo, F., A. B. Atkinson, L. Chancel, T. Piketty, E. Saez and G. Zucman (2017b), “Distributional National Accounts (DINA) Guidelines: Concepts and Methods used in WID.world”, WID.World Working Paper, June <http://wid.world/document/dinaguidelines-v1>
- Anand, S. and P. Segal (2015), "The global distribution of income", in A. B. Atkinson and F. Bourguignon (eds.), *Handbook of income distribution*, 2A, pp. 937–979, North-Holland, ), Amsterdam.
- Atkinson, A. B. (1997), “Bringing Income Distribution in From the Cold”, *The Economic Journal*, 107 (441), pp. 297-321.
- Atkinson, A. B. (2007), “Measuring Top Incomes: Methodological Issues” in Atkinson, A. B. and T. Piketty (eds.), *Top Incomes over the Twentieth Century - A Contrast between Continental European and English-Speaking Countries*, Oxford University Press, Oxford and New York.
- Atkinson, A. B. (2015), *Inequality. What Can Be Done?* Harvard University Press, Cambridge, MA.
- Atkinson, A. B. (2016), *Monitoring Global Poverty, Report of the Commission on Global Poverty*, World Bank, Washington, D.C.
- Atkinson, A. B. and F. Bourguignon (2000), *Handbook of Income Distribution*, Vol. 1, North-Holland, Amsterdam.
- Atkinson, A. B. and F. Bourguignon (1990), “Tax-Benefit Models for Developing Countries: Lessons from Developed Countries”, Chapter 14 in Khalilzadeh-Shirazi, J. and A. Shah (eds.), *Tax Policy in Developing Countries: A World Bank Symposium*, World Bank, Washington, D.C.
- Atkinson, A. B. and F. Bourguignon (eds.) (2015a), *Handbook of Income Distribution*, Vol. 2, North-Holland, Amsterdam: Elsevier.
- Atkinson, A. B. and F. Bourguignon (2015b), “Introduction: Income Distribution Today”, in Atkinson, A. B. and F. Bourguignon (eds.), *Handbook of Income Distribution*, Vol. 2, North-Holland, Amsterdam: Elsevier.



- Atkinson, A. B. and A. Brandolini (2001), "Promise and Pitfalls in the Use of Secondary Data-Sets: Income Inequality in OECD Countries as a Case Study", *Journal of Economic Literature*, 39 (3), pp. 771-799.
- Atkinson, A. B. and A. J. Harrison (1978), *Distribution of Personal Wealth in Britain*, Cambridge University Press, Cambridge, UK.
- Atkinson, A.B. and J. Micklewright (1983), "On the reliability of income data in the family expenditure survey 1970–1977", *Journal of the Royal Statistical Society Series, A* 146, 1, pp. 33-61.
- Atkinson, A. B. and T. Piketty (2007), *Top Incomes in the Twentieth Century*, Oxford University Press, Oxford.
- Atkinson, A. B. and T. Piketty (2010), *Top Incomes. A Global Perspective*, Oxford University Press, Oxford.
- Atkinson, A. B., T. Piketty and E. Saez (2011), "Top Incomes in the Long Run of History", *Journal of Economic Literature*, 49 (1), pp. 3-71.
- Atkinson, A. B., E. Marlier, F. Montaigne and A. Reinstadler (2010), "Income Poverty and Income Inequality", in Atkinson, A. B. and E. Marlier (eds.), *Income and Living Conditions in Europe*, Eurostat, Publications Office of the EU, Luxembourg.
- Autor, D. H., L. F. Katz and M. S. Kearney (2008), "Trends in U.S. Wage Inequality: Revising the Revisionists", *Review of Economics and Statistics*, 90(2), pp. 300–323.
- Bach, S., G. Corneo and V. Steiner (2009), "From Bottom To Top: The Entire Income Distribution In Germany, 1992-2003", *Review of Income and Wealth*, 55(2), pp. 303-330.
- Banerjee, A. and T. Piketty (2010), "Top Indian Incomes, 1922-2000", in: A. B. Atkinson and T. Piketty (eds.), *Top Incomes: A Global Perspective*, Oxford University Press, Oxford.
- Barofsky, J. (2018), "Appendix 6F. Comparison of Methods to Value the Distributional Impact of Health Spending", in N. Lustig (ed.), *Commitment to Equity Handbook. Estimating the Impact of Fiscal Policy on Inequality and Poverty*, Brookings Institution Press and CEQ Institute, Tulane University, at [www.commitmenttoequity.org](http://www.commitmenttoequity.org)
- Bastagli, F. (2015), "Bringing taxation into social protection analysis and planning", Working paper 421, ODI, May.
- Beegle, K., J. De Weerd, J. Friedman, and J. Gibson (2012), "Methods of Household Consumption Measurement through Surveys: Experimental Results from Tanzania", *Journal of Development Economics*, Vol 98, Issue 1, May, pp. 3-18.
- Belfield, C., J. Cribb, A. Hood and R. Joyce (2015), "Living Standards, Poverty and Inequality in the UK: 2015", Report 107, Institute for Fiscal Studies, London <http://www.ifs.org.uk/publications/7878>
- Benabou, R. (1996), "Inequality and Growth", *NBER Macroeconomics Annual 1996*, Vol. 11: MIT Press.
- Beneke, M., N. Lustig and J. A. Oliva (2018), "The Impact of Taxes and Social Spending on Inequality and Poverty in El Salvador", Chapter 13 in N. Lustig (ed.), *Commitment to Equity Handbook*.

*Estimating the Impact of Fiscal Policy on Inequality and Poverty*, Brookings Institution and CEQ Institute. <http://www.commitmentoequity.org/publications/handbook.php>

Biemer, P. and S. Christ (2008), “Weighting Survey Data”, Chapter 17, in De Leeuw, E., J. Hox, and D. Dillman (eds.), *International Handbook of Survey Methodology*, Psychology Press, Great Britain.

Blanchet, T., J. Fournier and T. Piketty (2017), "Generalized Pareto Curves: Theory and Applications," WID.world Working Paper 2017.

Bleaney, M. and A. Nishiyama (2003), “Convergence in Income Inequality: Differences Between Advanced and Developing Countries”, *Economics Bulletin*, 4 (22), pp. 1–10.

Bourguignon, F. (2003), “The Growth Elasticity of Poverty Reduction: Explaining Heterogeneity across Countries and Time Periods” in Eicher, T. and S. Turnovsky (eds.), *Inequality and Growth. Theory and Policy Implications*, The MIT Press, Cambridge, MA.

Bourguignon, F. (2015a), *The Globalization of Inequality*, Princeton University Press, New Jersey.

Bourguignon, F. (2015b), “Appraising Income Inequality Databases in Latin America”, in Ferreira, F. H. G. and N. Lustig (eds.), *Appraising Cross-National Income Inequality Databases*, special issue, *Journal of Economic Inequality*, 13 (4), pp. 557-578.

Bourguignon, F. (2016), “Issues in the Measurement of Income Inequality”, Keynote lecture at the conference on The Measurement of Income Distribution and Inequality, PUED-UNAM and INEGI, Mexico City, November 16.

Bourguignon, F. (2017a), “Equivalence Between Adjusting Income Levels and Sample Weights in Correcting Income Distributions”, unpublished document, Paris School of Economics, June.

Bourguignon, F. (2017b), “Correcting Survey Data for Top Incomes”, Powerpoint Presentation, Methodological Advances in Fiscal Incidence Analysis, Commitment to Equity Institute (Tulane University), Universidad de San Andrés, Buenos Aires, November 7 -8.

Bourguignon, F. and C. Morrisson (2002), "Inequality among world citizens: 1820–1992", *The American Economic Review*, 92(4), pp. 727-744.

Bourguignon, F., H. G. Ferreira and N. Lustig (eds.) (2005), *The Microeconomics of Income Distribution Dynamics in East Asia and Latin America*, World Bank and Oxford University Press, Washington, DC.

Bucheli, M., N. Lustig, M. Rossi and F. Amabile (2014), “Social Spending, Taxes and Income Redistribution in Uruguay”, in Lustig, N., C. Pessino and J. Scott (eds.), *The Redistributive Impact of Taxes and Social Spending in Latin America*, special issue, *Public Finance Review*, 42 (3), pp. 413-433.

Burkhauser, R. V., S. Feng and J. Larrimore (2010), "Improving Imputations of Top Incomes in the Public-Use Current Population Survey by Using Both Cell-Means and Variances", *Economic Letters*, 108 (1), pp. 69-72.

Burkhauser, R. V., J. Larrimore and S. Lyons (2016), “Measuring Health Insurance Benefits: The Case of People with Disabilities”, *Contemporary Economic Policy*, 35 (3), pp. 439-456, doi:10.1111/coep.12213

- Burkhauser, R. V., S. Feng, S. P. Jenkins and J. Larrimore (2012), “Recent trends in top income shares in the USA: reconciling estimates from March CPS and IRS tax return data”, *Review of Economics and Statistics*, 94, pp. 371–88.
- Cabrera, M., N. Lustig and H. E. Moran (2015), “Fiscal Policy, Inequality, and the Ethnic Divide in Guatemala”, *World Development*, 76, pp. 263-279.
- Campos-Vazquez, R. and N. Lustig (2017), “Labour income inequality in Mexico: Puzzles Solved and Unsolved”, UNU-WIDER Working Paper 2017/186, November.
- Canberra Group (2001), *Expert Group on Household Income Statistics: Final Report and Recommendations*, United Nations, Ottawa.
- Capgemini and Merrill Lynch (2011), *World Wealth Report*, New York.
- Chakravarty, S.R. (2009), *Inequality, Polarization and Poverty: Advances in Distributional Analysis*, Springer, New York.
- Cornia, G. A. (ed.) (2014), *Falling Inequality in Latin America: Policy Changes and Lessons*, UNU-WIDER, Studies in Development Economics, Oxford University Press, Oxford.
- Cowell, F. A. (2009), *Measuring Inequality*, Series London School of Economics Perspectives in Economic Analysis, Oxford University Press, Oxford.
- Cowell, Frank A. and E. Flachaire (2007), “Income Distribution and Inequality measurement: The Problem of Extreme Values”, *Journal of Econometrics*, 141(2), pp. 1044–1072.
- Cowell, F. A. and E. Flachaire (2015), “Statistical Methods for Distributional Analysis,” Chapter 6 in Atkinson, A. B. and F. Bourguignon (eds.), *Handbook of Income Distribution*, Vol. 2, North-Holland, Amsterdam: Elsevier.
- Cowell, F.A. and Victoria-Feser, M.-P. (1996), "Robustness properties of inequality measures", *Econometrica*, 64, pp. 77-101.
- Dabla-Norris, E., K. Kochhar, N. Suphaphiphat, F. Ricka and E. Tsounta (2015), “Causes and Consequences of Income Inequality: A Global Perspective”, International Monetary Fund, Washington D.C. <https://www.imf.org/external/pubs/ft/sdn/2015/sdn1513.pdf>
- Deaton, A. (2005), “Measuring Poverty in a Growing World (or Measuring Growth in a Poor World)”, *The Review of Economics and Statistics*, 87 (1), pp. 1-19.
- Deaton, A. (2013), *The Great Escape: Health, Wealth and the Origins of Inequality*, Princeton University Press, Princeton.
- Deaton, A. (2015), “On Tyrannical Experts and Expert Tyrants”, *The Review of Austrian Economics*, 28 (4), pp. 407-412.
- Deere, C. D., F. Stewart, and R. Kanbur (2018), “Horizontal Inequalities, Intra-household Inequality, and the Gender Wealth Gap,” chapter in M. Durand, J-P. Fitoussi and J.E. Stiglitz (eds.), *For Good Measure: Advancing Research on Well-Being Metrics Beyond GDP*, report by the High Level Expert Group on Measuring Economic Performance and Social Progress, OECD Publishing, Paris.

- DeNavas-Walt, C. and B. D. Proctor (2015), "Income and Poverty in the United States: 2014", US Bureau of the Census, Washington D.C.
- Department for Work and Pensions (2015), "Households Below Average Income An Analysis of the Income Distribution 1994/95–2013/14", London.
- Diaz-Bazan, T. (2015), "Measuring Inequality from Top to Bottom", *World Bank Policy Research Paper* 7237, World Bank, Washington D.C.
- Duclos, J. and A. Araar (2006), "Poverty and Equity: Measurement, Policy and Estimation with DAD", International Development Research Centre, Springer, New York.
- Ebel, R. D. and J. E. Petersen (eds.) (2012), *Oxford Handbook of State and Local Government Finance*, Oxford University Press, Oxford.
- Esteban, J. and D. Ray (2006), "Inequality, Lobbying and Resource Allocation", *The American Economic Review*, 96 (1), pp. 257-279.
- EUROMOD, "Statistics on the Distribution and Decomposition of Disposable Income", <http://www.iser.essex.ac.uk/euromod/statistics/> (EUROMOD version no. G3.0)
- Ferreira, F. H. G. and N. Lustig (2015), "Appraising Cross-National Income Inequality Databases", special issue, *Journal of Economic Inequality*, 13 (4).
- Ferreira, F. H. G., N. Lustig and D. Teles (2015), "Appraising Cross-National Income Inequality Databases: An Introduction", in Ferreira, F. H. G. and N. Lustig, *Appraising Cross-National Income Inequality Databases*, special issue, *Journal of Economic Inequality*, 13 (4), pp. 497-526.
- Ferreira, F. H. G., J. Messina, J. Rigolini, L. F. Lopez-Calva, M. A. Lugo and R. Vakis (2012), "Economic Mobility and the Rise of the Latin American Middle Class", *Latin America and Caribbean Studies*, World Bank, Washington D.C.
- Ferreira F. H. G., S. Chen, A. Dabalén, Y. Dikhanov, N. Hamadeh, D. Jolliffe, A. Narayan, E. B. Prydz, A. Revenga, P. Sangraula, U. Serajuddin and N. Yoshida (2016), "A global count of the extreme poor in 2012: data issues, methodology and initial results", *The Journal of Economic Inequality*, 14 (2), pp. 141-172.
- Fesseau, M. and M. L. Mantonetti (2013), "Distributional Measures Across Household Groups in a National Accounts Framework", OECD Statistics Working Paper 53, , [http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=STD/CSTAT/WPNA\(2013\)10/RD&docLanguage=En](http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=STD/CSTAT/WPNA(2013)10/RD&docLanguage=En)
- Fisher, J., D. Johnson, T. Smeeding and J. Thompson (2016), "Inequality in 3D: Income, Consumption and Wealth", Working Paper Series, Washington Center for Equitable Growth, September.
- Fishlow, A. (1973), "Some Reflections on Post 1964 Brazilian Economic Policy", in Stepan, A. (ed.), *Authoritarian Brazil*, Yale University Press, New Haven.
- Garbinti, B., J. Goupille-Lebret and T. Piketty (2016), "Income Inequality in France, 1990-2014: Evidence from Distributional National Accounts (DINA)", WID.world Working Paper, December.

- Gasparini L. and L. Tornarolli (2015), “A Review of the OECD Income Distribution Database”, in Ferreira, F. H. G. and N. Lustig, Appraising Cross-National Income Inequality Databases, special issue, *Journal of Economic Inequality*, 13 (4), pp. 479-602.
- Groves, R. M., F. J. Fowler, Jr., M. P. Couper, J. M. Lepkowski, E. Singer, R. Tourangeau (2009), *Survey Methodology*, John Wiley & Sons, New Jersey.
- Gurria, A. (2011), “Tackling Inequality,” *OECD Observer*, [http://oecdobserver.org/news/fullstory.php/aid/3717/Tackling\\_inequality.html](http://oecdobserver.org/news/fullstory.php/aid/3717/Tackling_inequality.html)
- Higgins, S. and C. Pereira (2014), “The Effects of Brazil’s High Taxation and Social Spending on the Distribution of Household Income”, in Lustig, N., C. Pessino and J. Scott (eds.), The Redistributive Impact of Taxes and Social Spending in Latin America, special issue, *Public Finance Review*, 42 (3), pp. 346–67.
- Higgins, S. and N. Lustig (2016), “Can a Poverty-Reducing and Progressive Tax and Transfer System Hurt the Poor?”, *Journal of Development Economics*, 122, pp. 63-75.
- Higgins, S. and N. Lustig (2018), “Allocating Taxes and Transfers, Constructing Income Concepts, and Completing Sections A, B, and C of CEQ Master Workbook”, chapter 6 in Lustig, N. (ed.), *Commitment to Equity Handbook. Estimating the Impact of Fiscal Policy on Inequality and Poverty*, Brookings Institution Press and CEQ Institute, Tulane University, Washington D.C. Advance online version available at <http://www.commitmentoequity.org/publications/handbook.php>
- Higgins, S., N. Lustig, and A. Vigorito (2017), “Top Incomes, Issues with Survey Data, and Inequality: Evidence from Simulations and Linked Income and Tax Return Data”, Powerpoint Presentation, LACEA Annual Meeting, Buenos Aires, November 9.
- Hill, R., G. Inchauste, N. Lustig, E. Tsehaye and T. Woldehanna (2017), “A Fiscal Incidence Analysis for Ethiopia”, chapter in Inchauste, G. and N. Lustig (eds.), *The Distributional Impact of Taxes and Transfers. Evidence from Eight Low- and Middle-Income Countries*, World Bank, Washington, D.C.
- Hlasny, Vladimir and Paolo Verme (2017), “The Impact of Top Incomes Biases on the Measurement of Inequality in the United States”, *ECINEQ Working Paper*, 452, November.
- Klasen, S., G.A. Cornia, R. Grynspan, L.F. Lopez-Calva and N. Lustig (2018), “Economic Inequality and Social Progress” chapter in *Rethinking Society for the 21th Century*, Report of the International Panel on Social Progress, Cambridge University Press.
- ILO (2015), *Global Wage Report 2014/15: Wages and Income Inequality*, International Labor Office, Geneva.
- IMF (2012), *Fiscal Monitor October 2012: Taking Stock A Progress Report on Fiscal Adjustment*, Washington, D.C.
- IPSP (2018), *Rethinking Society for the 21th Century. Report of the International Panel on Social Progress*, Cambridge University Press.
- ISSC, IDS and UNESCO (2016), *World Social Science Report 2016, Challenging Inequalities: Pathways to a Just World*, UNESCO Publishing, Paris. <http://unesdoc.unesco.org/images/0024/002458/245825e.pdf>

- Inchauste G., N. Lustig, M. Maboshe, C. Purfield, I. Woolard and P. Zikhali (2017), “The Distributional Impact of Fiscal Policy in South Africa”, chapter in Inchauste, G. and N. Lustig (eds.), *The Distributional Impact of Taxes and Transfers. Evidence from Eight Low- and Middle-Income Countries*, World Bank, Washington, D.C.
- Jaramillo, M. (2014), “The Incidence of Social Spending and Taxes in Peru”, in Lustig, N., C. Pessino and J. Scott (eds.), *The Redistributive Impact of Taxes and Social Spending in Latin America, special issue, Public Finance Review*, 42. (3), pp. 391-412.
- Jayadev, A., R. Lahoti and S.G. Reddy (2015), "Who got what, then and now? A Fifty-Year Overview from the Global Consumption and Income Project", May 8.
- Jenkins, S. P. (2015), “World Income Inequality Databases: An Assessment of WIID and SWIID”, in Ferreira, F. H. G. and N. Lustig, *Appraising Cross-National Income Inequality Databases, special issue, Journal of Economic Inequality*, 13 (4), pp. 629-671.
- Jenkins, S. P. (2017), “Pareto Models, Top Incomes and Recent Trends in UK Income Inequality”, *Economica*, 84 (334), pp. 261-289.
- Jenkins, S. P. and P. Van Kerm (2009), “The Measurement of Economic Inequality” in Salverda, W., B. Nolan and T. M. Smeeding (eds.), *The Oxford Handbook of Economic Inequality*, Oxford University Press, Oxford.
- Jenkins, S. P., R. V. Burkhauser, S. Feng and J. Larrimore (2011), “Measuring inequality using censored data: a multiple-imputation approach to estimation and inference”, *Journal of the Royal Statistical Society, Series A (Statistics in Society)*, 174 (1). pp. 63-81.
- Klasen, S., Cornia, G. A., R. Grynspan, L. F. Lopez-Calva and N. Lustig (2018), “Inequality an Social Progress”, Chapter 3 in *Rethinking Society for the 21st Century. Report of the International Panel on Social Progress*, Cambridge University Press.
- Koen, D., M. Fleurbaey and E. Schokkaert (2015), “Inequality, Income and Well-Being”, Chapter 3 in Atkinson, A. B. and F. Bourguignon (eds.), *Handbook of Income Distribution*, Vol. 2, North-Holland, Amsterdam: Elsevier.
- Korinek, A., J. A. Mistiaen, J.A. and M. Ravallion (2006), "Survey nonresponse and the distribution of income", *Journal of Economic Inequality*, 4, pp. 33-55.
- Kuznets, S. (1953), *Economic Change*, Norton, New York.
- Lakner, C. and B. Milanovic (2015), “Global Income Distribution: From the Fall of the Berlin Wall to the Great Recession”, *The World Bank Economic Review*, Volume 30, Issue 2, pp. 203–232.  
<http://dx.doi.org/10.1093/wber/lhv039>
- Lemieux, T. (2006), “Increasing Residual Wage Inequality: Composition Effects, Noisy Data, or Rising Demand for Skill?”, *American Economic Review*, 96 (3), pp. 462-498.
- Little, R. J. A. and D. B. Rubin. (2014), *Statistical Analysis with Missing Data*, Second Edition, Wiley Series in Probability and Statistics, John Wiley and Sons, Inc., New Jersey.
- Lopez-Calva, L. F. and N. Lustig (eds.) (2010), *Declining Inequality in Latin America: A Decade of Progress?*, Brookings Institution Press and UNDP, Washington, D.C.

- Love, J. (2016), "Christine Lagarde on Income Inequality, Brexit and the Power of M&Ms", *Kellogg Insight, Policy*, October 10, <https://insight.kellogg.northwestern.edu/article/christine-lagarde-on-income-inequality-brexit-and-the-power-of-mms>
- Lustig, N. (2016), "Inequality and Fiscal Redistribution in Middle Income Countries: Brazil, Chile, Colombia, Indonesia, Mexico, Peru and South Africa", *Journal of Globalization and Development*, 7 (1).
- Lustig, N. (ed.) (2018a), *Commitment to Equity Handbook. Estimating the Impact of Fiscal Policy on Inequality and Poverty*, Washington, DC: Brookings Institution Press and CEQ Institute, Tulane University. Advance online version available at <http://www.commitmenttoequity.org/publications/handbook.php>
- Lustig, N. (2018b), "Fiscal Policy, Income Redistribution and Poverty Reduction in Low and Middle Income Countries," Chapter 10 in Lustig, N. (ed.), *Commitment to Equity Handbook. Estimating the Impact of Fiscal Policy on Inequality and Poverty*, Washington, DC: Brookings Institution Press and CEQ Institute, Tulane University. Advance online version available at <http://www.commitmenttoequity.org/publications/handbook.php>
- Lustig, N. (Forthcoming), "The Sustainable Development Goals, Domestic Resource Mobilization and the Poor," Chapter 5 in J. A. Ocampo and J. E. Stiglitz, (eds.), *The Welfare State Revisited*, Chicago Press.
- Lustig, N. (2018c), "The Missing Rich in Household Surveys: Causes and Correction Methods," CEQ Working Paper 75 (Commitment to Equity (CEQ) Institute, Tulane University).
- Lustig, N. and D. Teles (2016), "Inequality Convergence: How Sensitive are Results to the Choice of Underlying Data?" Department of Economics Working Paper 1613, Tulane University, October.
- Meyer, B. D., W. K. C. Mok and J. X. Sullivan (2015), "Household Surveys in Crisis," *Journal of Economic Perspectives* 29 (4), pp. 199-226.
- Milanovic, B. (2016), *Global inequality: A New Approach for the Age of Globalization*, Cambridge, MA: Harvard University Press.
- Mirrlees, J. A. (1971). "The Theory of Optimum Income Taxation," *The Review of Economic Studies*, Vol. 38, No. 2, (April), pp. 175-208.
- Mistiaen, J.A. and M. Ravallion. (2003). "Survey compliance and the distribution of income," Policy Research Working Paper #2956, The World Bank.
- Novokmet F., T. Piketty, and G. Zucman (2017), "From Soviets to Oligarchs: Inequality and Property in Russia 1905-2016," WID.world Working Paper Seires No. 2017/09, Paris School of Economics.
- OECD (2008). *Growing Unequal? Income Distribution and Poverty in OECD Countries*, OECD Publishing, Paris.
- OECD (2011), *Divided We Stand. Why Inequality Keeps Rising*, OECD Publishing, Paris.
- OECD (2013a), *OECD Guidelines for Micro Statistics on Household Wealth*, OECD Publishing, Paris.

- OECD (2013b), *OECD Framework for Statistics on the Distribution of Household Income, Consumption and Wealth*, OECD Publishing, Paris.
- OECD (2015), *In It Together: Why Less Inequality Benefits All*, OECD Publishing, Paris.
- Ostry, J., A. Berg and C. G. Tsangarides (2014), "Redistribution, Inequality, and Growth", IMF Staff Discussion Note 14/02.
- Oxfam (2016), "An Economy for the 1%", 210 Oxfam Briefing Paper, January.  
[https://www.oxfam.org/sites/www.oxfam.org/files/file\\_attachments/bp210-economy-one-percent-tax-havens-180116-en\\_0.pdf](https://www.oxfam.org/sites/www.oxfam.org/files/file_attachments/bp210-economy-one-percent-tax-havens-180116-en_0.pdf)
- Paz Arauco, V., G. Gray-Molina, W. Jimenez and E. Yañez (2014), "Explaining Low Redistributive Impact in Bolivia," in Lustig, N., C. Pessino and J. Scott, *The Redistributive Impact of Taxes and Social Spending in Latin America*, special issue, *Public Finance Review* 42 (3), pp. 326-345.
- Piketty, T (2001), *Les Hauts revenus en France au 20e siècle : inégalités et redistribution, 1901-1998*, Paris: Ed. Grasset.
- Piketty, T. (2014), *Capital in the Twenty-First Century*, Cambridge, MA: Harvard University Press.
- Piketty, T. and E. Saez (2003), "Income Inequality in the United States 1913-1998," *Quarterly Journal of Economics* 118 (1), pp. 1-39.
- Piketty, T., E. Saez, and G. Zucman (2016), "Distributional National Accounts: Methods and Estimates for the United States", NBER Working Paper No. 22945.
- Piketty, T., L. Yang and G. Zucman (2016), "Capital Accumulation, Private Property and Rising Inequality in China 1978-2015," WID.world Working Paper.
- Ravallion, M. (2001), "Growth, Inequality and Poverty: Looking Beyond Averages," *World Development* 29 (11), pp. 1803-1815.
- Ravallion, M. (2003), "Inequality Convergence," *Economics Letters* 80 (3), pp. 351–356.
- Ravallion, M. (2015), "The Luxembourg Income Study," in Ferreira, F. H. G. and N. Lustig, *Appraising Cross-National Income Inequality Databases*, special issue, *Journal of Economic Inequality* 13 (4), pp.527-547.
- Rawls, J. (1971), *A Theory of Justice*, Cambridge, MA: Harvard University Press.
- Roemer, J. E., and A. Trannoy (2015), "Equality of Opportunity," Chapter 4 in Atkinson, A. B. and F. Bourguignon (eds.), *Handbook of Income Distribution*, Vol. 2, North-Holland, Amsterdam: Elsevier.
- Ruiz, N. and N. Woloszko (2016), "What Do Household Surveys Suggest About the Top 1% Incomes and Inequality in OECD Countries?" OECD Economics Department Working Paper 1265, January.  
[http://www.oecd-ilibrary.org/economics/what-do-household-surveys-suggest-about-the-top-1-incomes-and-inequality-in-oecd-countries\\_5jrs556f36zt-en](http://www.oecd-ilibrary.org/economics/what-do-household-surveys-suggest-about-the-top-1-incomes-and-inequality-in-oecd-countries_5jrs556f36zt-en)
- Saez, E. (2003), "The effect of marginal tax rates on income: a panel study of 'bracket creep'," *Journal of Public Economics* 87 (5), pp. 329-347.



- Saez, E. and G. Zucman (2016), "Wealth Inequality in the United States Since 1913: Evidence from Capitalized Income Tax Data," *The Quarterly Journal of Economics* 131 (2), pp. 519-578.
- Sahn, D. E. and S. Younger (2000), "Expenditure Incidence in Africa: Microeconomic Evidence," *Fiscal Studies* 21 (3), pp. 329-347.
- Sauma, P. and J. D. Trejos (2014), "Social Public Spending, Taxes, Redistribution of Income, and Poverty in Costa," CEQ Working Paper 18, Center for Inter-American Policy and Research and Department of Economics, Tulane University and Inter-American Dialogue, March.
- Save the Children (2012), Annual report 2012, London: The Save the Children Fund.
- Scott, J. (2014), "Redistributive Impact and Efficiency of Mexico's Fiscal System," in Lustig, N., C. Pessino and J. Scott, *The Redistributive Impact of Taxes and Social Spending in Latin America*, special issue, *Public Finance Review* 42 (3), pp. 368-390.
- Sen, A. K. (1980), "Equality of what?" In McMurrin, S. M. (ed.), *Tanner Lectures on Human Values*, Cambridge, UK: Cambridge University Press.
- Smeeding, T. and J. P. Latner (2015), "PovcalNet, WDI and All the Ginis: A Critical Review," in Ferreira, F. H. G. and N. Lustig, *Appraising Cross-National Income Inequality Databases*, special issue, *Journal of Economic Inequality* 13 (4), pp. 603-628.
- Solt, F. (2009), "The Standardized World Income Inequality Database," *Social Science Quarterly* 90 (2), pp. 231-460.
- Stiglitz, J., A. Sen and J. P. Fitoussi (2009), Report by the Commission on the Measurement of Economic Performance and Social Progress,
- Stiglitz, J. (2012), *The Price of Inequality: How Today's Divided Society Endangers Our Future*, New York: W. W. Norton & Company.
- Székely, M. and M. Hilgert: 1999, 'What's Behind the Inequality We Measure: An Investigation Using Latin American Data'. Research Department Working Paper Inter-American Development Bank.
- UNDESA (2011), *Social inequalities concern us all*, New York: UN, <http://www.un.org/en/development/desa/news/social/social-inequalities.html>
- UNECE (2011), *The Canberra Group Handbook on Household Income Statistics, Second Edition*, Geneva: UN, [https://www.unece.org/fileadmin/DAM/stats/groups/cgh/Canbera\\_Handbook\\_2011\\_WEB.pdf](https://www.unece.org/fileadmin/DAM/stats/groups/cgh/Canbera_Handbook_2011_WEB.pdf)
- UNICEF (2011), *Annual Report 2010*, New York: UN. [https://www.unicef.org/publications/index\\_59002.html](https://www.unicef.org/publications/index_59002.html)
- UNDP (2014), *Annual Report 2013-2014: New Partnerships for Development*, New York. <http://www.undp.org/content/undp/en/home/librarypage/corporate/annual-report-2014.html>
- World Bank (2006), *World Development Report 2006: Equity and Development*, Washington, DC: World Bank and Oxford University Press, <http://documents.worldbank.org/curated/en/435331468127174418/pdf/322040World0Development0Report02006.pdf>

- World Bank (2016), *Poverty and Shared Prosperity 2016: Taking on Inequality*, Washington, DC: World Bank, <https://openknowledge.worldbank.org/handle/10986/25078>
- World Bank (2017), *World Development Report 2017: Governance and the Law*, Washington, DC: World Bank, <https://www.worldbank.org/en/publication/wdr2017>
- Wittenberg, M. (2015), “Problems with SWIID: the case of South Africa,” in Ferreira F. H. G. and N. Lustig, *Appraising Cross-National Income Inequality Databases*, special issue, *Journal of Economic Inequality* 13 (4), pp 673-677.
- Younger, S. D. and A. Khachatryan (2014), “CEQ Master Workbook: Armenia. Version: May 31, 2014,” CEQ Data Center on Fiscal Redistribution (CEQ Institute, Tulane University and the World Bank).
- Younger, S. D. and A. Khachatryan (2017), “Fiscal Incidence in Armenia,” chapter in Inchauste, G. and N. Lustig (eds.), *The Distributional Impact of Taxes and Transfers. Evidence from Eight Low- and Middle-Income Countries*, Washington, DC: World Bank.
- Zwijnenburg, J., S. Bournot and F. Giovanelli (2017), “Expert Group on Disparities in a National Accounts Framework,: Results from the 2015 Exercise,” *OECD Statistics Working Papers*, 2016/10, OECD Publishing, Paris, [http://www.oecd-ilibrary.org/economics/expert-group-on-disparities-in-a-national-accounts-framework\\_2daa921e-en](http://www.oecd-ilibrary.org/economics/expert-group-on-disparities-in-a-national-accounts-framework_2daa921e-en)
- Zucman, G. (2015), *The Hidden Wealth of Nations. The Scourge of Tax Havens*, London: The University of Chicago Press.

## Databases

ATG (All the Ginis); <http://data.worldbank.org/data-catalog/all-the-ginis>

CEPALSTAT (UN Economic Commission for Latin America and the Caribbean),  
[http://estadisticas.cepal.org/cepalstat/WEB\\_CEPALSTAT/Portada.asp](http://estadisticas.cepal.org/cepalstat/WEB_CEPALSTAT/Portada.asp)

CEQ Standard Indicators (Commitment to Equity Institute, Tulane University),  
<http://www.commitmenttoequity.org/indicators.php>

EUROMOD (University of Essex), <https://www.euromod.ac.uk/>

GCIP (Global Consumption and Income Project), <http://gcip.info/>

The GINI Project, [http://www.gini-research.org/articles/data\\_2](http://www.gini-research.org/articles/data_2)

IDD (Income Distribution Database/OECD), <http://www.oecd.org/social/income-distribution-database.htm>

LIS/LWS (Luxembourg Income Study), <http://www.lisdatacenter.org/our-data/lws-database/>

Pew Research Center (Pew Research Global Attitudes Project), <http://www.pewglobal.org>

PovcalNet (World Development Indicators, World Bank),  
<http://iresearch.worldbank.org/PovcalNet/povOnDemand.aspx>

SEDLAC (Socio-Economic Database for Latin America and the Caribbean/CEDLAS at Universidad Nacional de La Plata and World Bank), <http://sedlac.econo.unlp.edu.ar/>

SWIID (Standardized World Income Inequality Database), <http://fsolt.org/swiid/>

UTIP (University of Texas Income Inequality Project), <http://utip.lbj.utexas.edu/>

WIID (World Income Inequality Database/UNU-WIDER), <https://www.wider.unu.edu/project/wiid-world-income-inequality-database>

WID.world (The World Wealth and Income Database), <http://wid.world/>

WTID (the World Top Incomes Database), <http://www.parisschoolofeconomics.eu/en/research/data-production-and-diffusion/the-world-wealth-income-database/>