Redistribution of Household Income: A New Size Measure Based on National Accounts

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Abstract: To measure redistribution, scholars have predominately relied on two well-established indicators: the difference between the Gini coefficient for primary and secondary incomes (i.e. before and after taxes and transfers) and so-called 'size redistribution', which is usually proxied by the share of public social expenditure in GDP. This paper proposes an alternative measure for the size of the government's intervention into the primary distribution of household incomes, based on national accounts. It lies down the argument why the new measure corresponds more closely to the theoretical concept of interest, discusses its limitations and then presents a new secondary dataset with 1,590 observations from 80 countries and territories, covering the period 1950 to 2014. It concludes by presenting some descriptive statistics to illustrate the potential applications of the indicator and sounds a note of caution regarding possible pitfalls.

JEL codes: D31, E01, H23.

Key words: redistribution, taxes and transfers, national accounts, household sector

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1. Introduction

Given the rise of income inequality in most advanced democracies and many emerging market economies, the question how public policy can contain corrosive income disparities has gained prominence (Atkinson, 2015). While policy makers can use education policies or labour market institutions to shape the primary distribution of incomes, they also hold a direct lever to change the income distribution: fiscal redistribution through the tax and transfer system. Why and under what conditions governments redistribute incomes is the subject of a bourgeoning literature on the determinants of redistribution. This literature has advanced explanations as diverse as the power resources available to the working class (see Korpi, 1978), the utility-maximization of the median voter (Meltzer and Richard, 1981), the characteristics of the electoral system (Iversen and Soskice, 2006) or the social affinity of different groups (Kristov et al., 1992; Lupu and Pontusson, 2011).

To test the validity of the validity theoretical approaches, a valid measure for redistribution is needed. Here, in contrast to the heterogeneity of theory, the literature has converged onto only two main concepts. The first approach is to measure the impact that fiscal redistribution has on income inequality, usually expressed as the change in the Gini coefficient as one moves from the distribution of primary incomes to the distribution of disposable incomes. The second approach is concerned with the scale of redistributive government interventions, or the size of redistribution. The traditional practice is to rely on government finance statistics to construct a proxy indicator, most commonly public social expenditure as a percentage of GDP.

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These two well-established concepts have complementary functions: the size redistribution approach tries to quantity how much of households' market incomes are appropriated by the state and then redistributed, whereas the change in the Gini coefficient assesses the impact that taxes and transfers have in income inequality. While some theoretical models of fiscal redistribution assume that the two measures can be used interchangeably[2], in the real world they capture two different aspects of redistribution and, if properly operationalized, can help to answer two distinct questions: How much does the state redistribute? And: What is the effect of fiscal redistribution on income inequality?

Depending on whether transfers are targeted at the poor or a primarily an insurance mechanism that benefits the middle class, greater social expenditure need not always lead to a greater reduction of inequality (see Kraus, 2004). Likewise, holding the state's tax take constant, a more progressive tax schedule will lead to a greater reduction in inequality (Kakwani, 1977). Hence, there are good reasons to measure both the size of redistribution and the subsequent reduction in inequality. However, taking advantage of the increased availability of micro-data that allow comparing inequality before and after taxes and transfers, many researchers have abandoned the concept of size redistribution altogether and focused exclusively on distributive outcomes (see McCarthy and Pontusson, 2011: 667f.). On the whole, the literature (the present author included) has reflected little on the theoretical implications of this shift, i.e. on whether it makes a conceptual difference to measure the magnitude of government intervention or its distributive outcomes.

In contrast to the consensus in the literature, the main concern of this paper is the size of redistribution. It argues that the most common measure – social spending as a percentage of GDP – has been borrowed from the related literature on welfare states and is a flawed proxy for the magnitude of fiscal redistribution. However, this does not mean that the question how much (as opposed how effectively) governments redistribute has become irrelevant. As an alternative to reliance on an imperfect proxy, this paper suggests operationalizing the underlying concept directly and points to underutilized data-source, national accounts. They allow tracking the size of transfer payments received by households, and capture how much of gross (pre-tax) incomes are collected by the state in the form of taxes and social security contributions. In other words, national accounts allow us to follow the size of redistributive transactions that lead from primary to disposable incomes.[3]

The paper makes three main contributions to the literature on redistribution. Firstly, it highlights that the old distinction between the scale of a government intervention and its effect is still relevant to research on redistribution, even though it has gone largely lost. Secondly, it proposes an indicator that measures the size of redistribution from the perspective of households that can usefully complement the established indicators that measure the change in inequality. Thirdly, it introduces a new secondary data-set that provides easy access to data for the size of redistribution across countries and time, adding the necessary caveats regarding limitations to comparability and other potential drawbacks.

[2] See notably Meltzer and Richard (1981), who assume flat taxes and lump-sum redistribution. Hence, size redistribution and the (relative) reduction in the Gini coefficient are monotonously related to each other.

[3] In line with the literature, this paper uses the following terminology: the primary distribution refers to market or factor incomes and is expressed pre-tax and pre-transfer; the secondary distribution refers to disposable household incomes and is expressed post-tax and post-transfer; the tertiary distribution refers to adjusted disposable incomes that also include social transfers in kind. Wherever possible, the term 'gross' is avoided since it has two distinct meanings: 'gross of taxes' in the context of survey data, and 'gross of consumption of fixed capital' in the national accounts.

The remainder of this paper is organized as follows. Section 2 reviews the available measures for redistribution, primarily to learn how some of the principles that have emerged in the literature that measures redistribution as the change in inequality can be applied to a measure for the size of redistribution. Section 3 introduces how the System of National Accounts records redistributive flows and explains how accounting concepts can be used to construct a size measure for redistribution. Section 4 outlines current data availability, discusses limitations to comparability, and outlines the methodological choices made in compiling the secondary data-set. Section 5 presents some descriptive statistics to illustrate potential applications, and Section 6 concludes.

2. Measuring redistribution: Concepts and approaches

In its dictionary meaning, redistribution refers to altering the distribution of something.[4] Redistributive policies could then be defined as all public policies that change the distribution of incomes (or wealth), whether directly or indirectly. Hicks and Swank (1984a) in fact propose such an encompassing definition of government redistribution. They include both the effects of regulatory policies (for instance, by regulating labour markets or guaranteeing private property rights) and the impact of fiscal policy, including their indirect effects (for instance, by stimulating economic activity and creating employment). However, both indirect effects of fiscal policy and the impact of regulation on inequality are notoriously difficult to measure.

The literature on redistribution has therefore largely confined itself to measuring direct fiscal redistribution, defined as the process through which the state intervenes into the primary distribution of household incomes through taxes and transfers, leading to a different, generally more equitable secondary distribution of incomes. Note that this definition does not require the state to disburse all receipts from taxation (which, as long as tax schedules are progressive, reduces income inequality by itself). This leaves two principle options to measure redistribution: either to evaluate how much redistribution reduces income inequality, or to quantify the magnitude of government intervention in terms of the size of redistributive flows. The literature has pursued both avenues, which are addressed in turn.

2.1. Measuring redistribution as the change in inequality

Hicks and Swank (1984a) suggested measuring the effect of fiscal redistribution on income inequality by comparing the Gini coefficient for household income before and after taxes and transfers, i.e. for primary and disposable household incomes (see also Musgrave and Thin, 1948). The difference can either be expressed as the percentage point reduction in the Gini coefficient (commonly called 'absolute redistribution'), or as the change in the Gini relative to its initial level (hence 'relative redistribution'). Both options are now widely used. Many researchers prefer to use the absolute measure as the more intuitive approach (see e.g. Kenworthy and Pontusson, 2005: 450). However, some theoretical models (like the median voter theorem) make predictions that refer to relative redistribution, making it the only appropriate choice for empirical tests (Luebker, 2014: 135ff.).

While Hicks and Swank compiled single observations from 13 countries in their 1984 paper, data availability has since greatly improved. Mahler and Jesuit (2006) extracted 59 country-year observations from the data-base of the Luxembourg Income Study (LIS) and later expanded their compilation to cover 68 data points. Thewissen et al. (2016) expanded this work to cover to 27

[4] See, for example, the online Merriam-Webster dictionary at http://www.merriam-webster.com/dictionary/redistribute.

developed countries with 171 observations,[5] whereas the latest LIS-based compilation by Caminada et al. (2017) covers 293 country-years from 47 high- and middle-income countries. Although the underlying household income surveys inevitably have some methodological differences, the harmonization of micro-datasets means that the comparability of these data points is generally considered to be good (see e.g. Atkinson, 2004).[6] The availability of both market and disposable incomes in the same dataset has also been exploited by many other studies on redistribution and poverty (for examples, see Nieuwenhuis et al., 2017).

The number of LIS-based data-points pales next to 812 country-year observations for absolute and relative redistribution in the latest version of the Comparative Welfare States Data Set (CWS), the work-horse of much comparative political economy research (Brady et al., 2016). The CWS derives these data from the Standardized World Income Inequality Database (SWIID) (see Solt, 2016), which in turn draws heavily on UNU-WIDER's World Income Inequality Database (WIID). In its latest version 3.4, the WIID has amassed more than 8,800 Gini coefficients from a wide variety of sources – albeit at the expense of a lack of comparability. Solt attempts to address these conceptual differences through a multiple imputation (MI) procedure, producing 100 different (and sometimes wildly varying) Gini estimates for market and net inequality for each data point (even where no actual observations are available).[7] While the variability of the MI estimates reflects the underlying uncertainty (Solt, 2016: 14), the CWS only presents the averages and hence tempts researches to treat them as if they were actual observations.

2.2. Measuring redistribution as the share of social spending in GDP

An early example for the alternative approach is Cutright's (1967) paper "Income Redistribution: A Cross-National Analysis". He used the share of Gross National Income (then known as Gross National Product) allocated to social security programmes as a "measure of the national effort to redistribute income through government programs". In other words, what counted for him was the size of the intervention (the 'redistributive effort'), not the effect that this effort had on inequality. Likewise, in another paper, Hicks and Swank (1984b) studied direct cash transfer payments as a proportion of GDP and argued that they "appear central to the redistributive dimensions of political ideology" (ibid.: 84). In the decades since, the comparative welfare state literature has sought to establish the

[5] Note that the total number of data-sets used in this study is slightly higher. However, not all data-sets included in the analysis allow comparing the Gini before and after taxes and transfers.

[6] For instance, the researchers cited above apply common income concepts, equivalence scales and so forth. None withstanding, LIS is not immune to potential biases that affect all household surveys (such as non-response that differs by income strata; see Ravallion [2015: 544f.]).

[7] For a careful review of the methodological details and their substantive implications, albeit for an older version of the SWIID, see Jenkins (2015). Expressed on grossly simplified terms, the imputation procedure calculates the ratios between Ginis for different income and measurement concepts (based on instances where parallel observations exist) and then uses these ratios to generate plausible values for both market and net (disposable) Ginis from observations where one or the other (or a third) concept is measured. The underlying rationale is that the observable net-to-market ratios (and ratios between any other concepts) can be used to estimate relationship between these Ginis at other points in time within the same country, and in some cases within groups of countries (see Solt, 2016). This approach is of course problematic when the SWIID data are used to investigate how the relationship between market and disposable incomes varies over time and across countries (i.e. when studying redistribution). Ferreira et al. (2015: 521) hence warn against placing too much trust in cross-country regressions that use redistribution data from SWIID.

factors that drove welfare state expansion and produced "literally hundreds of studies on social spending" (Bradley et al., 2003: 195).[8]

In the early 1990s, the endogenous growth literature approached redistribution from a very different vantage point. It argued that higher initial levels of inequality create demand for redistribution, and that politicians would oblige by levying higher taxes to fund larger welfare payments. However, high taxes and transfers would distort incentives, and ultimately reduce investment and growth (see Alesina and Rodrik, 1994; Persson and Tabellini, 1994). While some of these early contributions tested reduced-form relationships between inequality and growth (e.g. Alesina and Rodrik, 1994), others introduced the share of public social expenditure as a share of GDP as a proxy for the magnitude of redistribution (Persson and Tabellini, 1994; Basset et al., 1999). It turned out that, in fact, neither greater social spending nor higher taxes reduce growth (Perotti, 1996), and that the link between higher inequality and inferior growth performance might run through political instability (ibid.; Alesina and Perotti; 1996).[9] The subsequent literature has settled around the insight that he classical trade-off between equity and growth (Okun, 1975) might not exist, or be modest at most (Ostry et al., 2014).

2.3. Measuring size or effect: A settled question?

While both measures were used in roughly equal proportions until the early 2000s, the more recent literature has all but abandoned social spending as an indicator for redistribution (for an exception, see the robustness test in Lupu and Pontusson, 2011). Of course, social expenditure continues to be a subject of interest in its own right (Adema et al., 2011) and the link between the size of social spending and redistributive outcomes remains of interest (see e.g. Castles and Obinger, 2007; Esping-Andersen and Myles, 2011). However, even within the welfare state literature, one of the more robust defences is that the indicator is 'less bad than its reputation' (Jensen, 2011).[10] Few researchers who are primarily interested in redistribution now feel the need to 'borrow' the social spending indicator, given that data on the effect of fiscal redistribution on income inequality are widely available. Across the comparative political economy literature, the current consensus approach is to measure redistribution on the basis of the LIS data (see e.g. Bradley et al., 2003; Huber and Stephens, 2014) or the imputed values from the SWIID (Ostry et al., 2014).

Should this shift be welcomed? If we look at redistribution from the perspective of households, there are indeed compelling reasons to reject the social spending indicator. Whereas the LIS-based measures allow us to neatly track how inequality in the distribution of household incomes changes between the primary and secondary stage (and hence the outcomes of policy as they are experienced by citizens), social spending is an output indicator from the standpoint of public finances (see de Mello and Tiongson, 2006).[11] This is not surprising, given that the OECD's SOCX database (the main source for social expenditure data) was constructed for a different purpose: to monitor trends in social expenditure from a macro-perspective and to shed light on the resources governments

[8] One seldom discussed limitation of statistics on government expenditure by function is that they are only available in current prices (see IMF, 2014: 3.107). This means that analysts cannot distinguish between an increase in the volume of services provided (say, more kindergarten teachers) and an increase in prices (say, higher wages for kindergarten teachers). The implication is that expenditure data are "not well suited for understanding and explaining changes in the size and composition of government expenditure" (Bos, 2007: 18).

[9] For papers that try to disentangle the various steps of the argument, see e.g. Luebker (2006) and Thewissen (2014).

[10] Others prefer entitlements to 'social spending' as an indicator (Korpi and Palme, 2003).

[11] See Castles (2011) on this important distinction.

allocate to social purposes (for a comprehensive analysis, see Adema et al., 2011). This original purpose is reflected in the choice of both the numerator and the denominator.

Take the numerator, social expenditure, which is only loosely related to household income. While some of the resources governments devote to social purposes reach households in the form of transfer payments, a sizable share is allocated to social services and does not add to disposable household incomes.[12] More fundamentally, if redistribution is a give and take, the social expenditure indicator only tells one half of the story (the 'give') and contains no information about the taxes and social contributions paid by households. While transfers generally make the greatest contribution to the reduction in inequality, the progressivity of tax schedules means that taxation has a redistributive impact in its own right (see Wang et al., 2014). Clearly, omitting taxation from the analysis of redistribution is unsatisfactory from a conceptual standpoint.

The denominator of the established size indicator has similar shortcomings: Gross Domestic Product (GDP) is a measure of output, not of income (see SNA-08: Ch. 6).[13] The relevant economy-wide measure of income is Gross National Income (GNI). GNI can diverge from GDP substantially where the incomes that arise from production accrue to non-resident units (ibid.: Ch. 7; see also Stiglitz et al., 2009: 13). This is typically the case in offshore financial centres such as Luxembourg (where GNI amounted to 66.6 per cent of GDP in 2014), Liechtenstein (74.0 per cent) and Ireland (86.7 per cent). The reverse holds true where a country's residents derive income from employment abroad, for instance in the Philippines (120.0 per cent) or Lesotho (124.8 per cent) and many Pacific Island countries.[14] Changing the denominator to GNI would mitigate, but not solve the problem: GNI is not equivalent to household incomes. In industrialized countries, households' primary incomes typically amount to between two-thirds and three-quarters of GNI. However, this ratio is not stable over time and differs substantially between countries. In resource-extracting countries such as Bahrain, Mongolia and Norway the share of household incomes in GNI drops to around half, and to a quarter in Qatar.[15]

In sum, social expenditure is a poor proxy for the size of redistribution: Spending insufficiently captures the scale of government intervention into household incomes, and the denominator GDP diverges substantially and in unpredictable ways from aggregate household incomes, the concept of interest in the analysis of redistribution. The underlying issue is that indicator is constructed from the vantage point of the macro-economy to capture government output – while the study of redistribution is concerned with outcomes from the perspective of households.[16] It therefore falls far short of the conceptual purity that LIS-based measures achieve. However, the shortcomings of social

[12] The total expenditure in this latter category can be quite sizable: Across the OECD, 8.6 per cent of GDP were devoted to public social spending on services, not far behind the 12.3 per cent that went into cash benefits. A smaller share went into Active Labour Market Policies, which comprise both sending on cash transfers and services, bringing the total to 21.4 per cent (OECD, 2014: 4). Social services are of course a relevant feature of welfare states, though they technically concern the tertiary distribution of incomes (see also Esping-Andersen and Myles, 2011).

[13] For convenience and in line with convention, the relevant SNA manuals are cited as SNA-68 (United Nations, 1969), SNA-93 (United Nations et al., 1993) and SNA-08 (United Nations et al., 2009), and paragraph or chapter numbers are given.

[14] All data are based on UNSD, National Accounts Main Aggregates Database, Tables 'GNI at current prices in National currency (all countries)' and 'GDP/breakdown at current prices in National currency (all countries)' accessed online at http://unstats.un.org/unsd/snaama/selbasicFast.asp on 13 June 2016.

[15] Other institutional units, notably government and corporations, account for the remainder of GNI. All data are based on UNSD, National Accounts Official Country Data, Tables 4.1 and 4.6, accessed online at http://data.un.org/Explorer.aspx?d=SNA on 13 June 2016.

[16] See Stiglitz et al. (2009) for the broader argument in support of focusing on incomes from the perspective of households.

spending indicator do not imply that thinking about redistribution in terms of its size (rather than in terms of its impact on inequality) is conceptually invalid.

In fact, there are many research questions that are better addressed in terms of 'How much does the state redistribute?', and not as 'How good are states in reducing inequality?'. One example is the debate on whether globalization has eroded the redistributive capacity of states by constraining the state's ability to raise a sufficient volume of revenues from taxation (see Genschel and Seekopf, 2012; Dietsch and Rixen, 2014).[17] Another obvious case is the endogenous growth theory, as discussed above. Its primary concern was not the equalizing effect of taxes and transfers, but the hypothesis that more redistribution – higher tax rates, bigger welfare payments – introduces economic distortions that hold back investment and growth (Alesina and Rodrik, 1994; cf. Perotti, 1996). Likewise, the now classical proposition that unequal societies redistribute more was initially posed in terms of the 'size of government' (Meltzer and Richard, 1981). Last but not least, the relationship between the size of redistribution and distributive outcomes (i.e. of its efficiency) can only be addressed when both size and effect are measured independently of each other.

3. A new measure for the size of redistribution

How, then, do we go about constructing a measure for the size of redistribution? With the LIS-based measures for the reduction in inequality firmly established in the literature, the discussion above suggests that a size measure should meet their standards with respect to the following three principles: Firstly, redistribution concerns household incomes and should be analysed from the perspective of households, rather than through the lens of government (see Stiglitz et al., 2009: 13; cf. Tomaszewicz and Trębska, 2015). Secondly, of interest is the process that explains the transition from primary to disposable household incomes (and possibly to tertiary incomes). Thirdly, given the pitfalls of adjusting for definitional differences *ex post*, a measure for the size of redistribution should be as fully consistent as possible across countries and time (see Atkinson and Brandolini, 2001: 796).

This is a challenging standard. However, most of the groundwork has already been done. In the 1980s and early 1990s, a major topic of discussion among statisticians was how the distribution and redistribution of incomes could be better reflected within a revised System of National Accounts (SNA) (United Nations, 1987; Harrison, 1991 and 2005). The outcome of this decade-long exercise was a new sequence of accounts that details the generation, distribution and redistribution of income in the SNA-93 (United Nations et al., 1993).[18] The framework also distinguishes between five institutional sectors (including government and households) and maps the redistributive flows between (and within) these sectors. Under the revised structure, national accounts therefore contain aggregate information on the primary incomes of households, the amount of benefits and transfers they receive, and how much they pay in taxes and social contributions. This makes it possible to follow the entire redistributive process that lies between the primary and secondary distribution of incomes from the perspective of households.

Somewhat surprisingly, this data-source has rarely been used to analyse the redistribution of household income (for exceptions see de Mello and Tiongson, 2006; Luebker, 2015). A possible

[17] But see Crepatz (2001), who measures the state's redistributive capacity by the impact of redistribution on relative poverty, not its size of taxes and transfers.

[18] Following convention, this paper will cite the relevant SNA manuals simply as SNA-93 (United Nations et al., 1993) and SNA-08 (United Nations et al., 2009), followed by the reference to the relevant paragraph, chapter or annex.

explanation is that, while national accounts and economics have historically co-evolved, national accounting has become a highly specialized branch of economics that is, as insiders concede, "relatively inaccessible to outsiders" (Bos, 1997: 174). It uses a complex terminology that is differs from common usage and baffles even other accountants (those keeping companies' books; see Jones, 2000). Bos (2009: 7) despairingly observes "a worldwide illiteracy in national accounting" among economic researchers. With the exception of the Review of Income and Wealth, national accounts are rarely a topic in the academic literature. So it is perhaps understandable that few political scientists have had any ambition to work their way through the 700-odd pages of the latest SNA manual, not to mention the accompanying statistical tables that run to more than 4,000 pages across five volumes (United Nations et al., 2009; United Nations, 2015).[19]

Nonetheless, the national accounts are an underestimated and underutilized data source for applied economic and social analysis – including for the study of the redistribution of household income.[20] Of particular interest is the 'Secondary distribution of income account' (Account II.2). The remainder of this section will describe the major elements of this account, and to discuss how they differ (or do not differ) from the income concepts used in household surveys. This will form the basis to construct a new size measure for redistribution, and help to understand both the possible applications for the measure and its inherent limitations.

3.1. Understanding SNA concepts and their relation to survey measures

Table 1 presents a schematic structure of the "Secondary distribution of income account" for the household sector (Account II.2). The opening item is the balance of primary incomes, i.e. pre-tax and pre-transfer incomes. It is carried over from the "Allocation of primary income account" (Account II.1.2) and contains some familiar items: compensation of employees, net property income (i.e. dividends and interest etc. received, minus those payable), and the operating surplus and mixed income that households obtain from running unincorporated businesses or through self-employment. Less intuitive for those accustomed to working with micro-data, the compensation of employees does not only contain wages, but the entire pay package – including employers' social contributions that are paid directly by the employer to a social insurance institution.[21]

Starting from primary incomes, the account then describes the redistributive process by first adding two major sources of transfer income: Cash social benefits received by households (including social insurance and social assistance payments)[22] and other current transfers. Major components of the latter are transfers between households (such as alimony or child support payments) and non-life insurance claims. These are included on the basis that "the essential function of non-life insurance is to redistribute resources" (SNA-93: 8.87), even though their redistributive impact is often only apparent *ex ante* (see Luebker, 2015: 216f.).[23] Including voluntary private pensions and other private

[19] Bos (2009) himself provides a more accessible, yet comprehensive introduction into the national accounting framework.

[20] As an illustration, Google Scholar returns only 251 results for the term "Secondary distribution of income account" (of which many are related to Social Accounting Matrices, or SAMs). By comparison, a search for "Luxembourg Income Study" results in 12,800 hits – about 50 times as many (Google Scholar, accessed on 23 July 2018).

[21] These are conceptually also included in primary incomes for the purpose of household surveys (see UNECE, 2011: 10ff.) but in practice rarely measured.

[22] The national accounts further divide these into social security benefits in cash (D.621), private funded social insurance benefits (D.622), unfunded social insurance benefits (D.623), and social assistance benefits in cash (D.624). For details, see SNA-93 (8.75ff.).

[23] By contrast, life insurance is often predominately a savings vehicle.

insurance claims as income was a major innovation of the SNA-93 (see SNA-93, Annex IV). Prior to this, only benefits from social insurance schemes were included as transfer income, while receipts from voluntary private plans were treated as a withdrawal from savings (leading to an "unacceptable distortion", in the words of Ruggles and Ruggles, 1983: 381).

[*Table 1 about here*]

Next, current taxes and income and wealth, social contributions and other current transfers payable by households are recorded. Social contributions include those that are made directly by employers, offsetting their inclusion under compensation of employees and hence in primary incomes. The main rationale for this "re-routing" is to capture the economic substance of the flows, given that both employees' and employers' contributions build up entitlements (see SNA-08: 3.63). Corresponding to the treatment of non-life insurance claims in other transfer income, payments of net insurance premiums are included among the payable "other current transfers".[24]

The disposable income of households can then be obtained by adding transfer receipts to primary incomes, and deducting the payable items (technically known as "uses").[25] In other words, Account II.2 allows us to follow household incomes from the primary to the secondary distribution and to monitor all flows in terms of their size (though not in terms of their effect on the inter-household distribution of incomes). All of these flows can be analysed at a much greater level of detail (see SNA-08: Ch. 8), much like the LIS data allow researchers to analyse the detailed sources of household income beyond the major aggregates (Camianada et al. 2017: 47). Note that two items are typically not relevant for households: They do not receive any social contributions, and they do not disburse social benefits.

Conceptually, the SNA understanding of household income and redistribution is therefore close to the definitions that underpin the analysis of micro-data. This is no coincidence: Most statistical offices that conduct household surveys follow the guidelines of the Canberra Group on Household Income Statistics, which aimed at "consistent treatment across frameworks whenever possible" (UNECE, 2011: 5). The major flow variables from the SNA are therefore also familiar from LIS (which actively participated in the Canberra Group), albeit there are some differences in naming conventions.[26] Owed to the practical difficulties in collecting some sub-categories of incomes in household surveys, there are, however, some relatively minor definitional differences between the Canberra Group framework and the SNA concepts (see ibid.: 129ff.).[27]

In contrast to this broad conceptual correspondence, estimates for aggregate household income and consumption often differ substantially in practice, depending on whether they are derived from national accounts or household surveys (see Ravallion, 2003). This holds especially for developing countries, but there are also systematic measurement differences in the most advanced economies.

[24] The premiums are net of service charges, which are recorded under consumption expenditure (see SNA-08: 17.159).

[25] National accounts typically present product and income aggregates in gross terms (GDP or GNI), where 'gross' denotes gross of consumption of fixed capital (SNA-08: 2.141f.).

[26] For instance, 'primary incomes' (SNA and CGH) correspond to the major aggregate 'factor income' in LIS.

[27] For instance, both SNA and the Canberra Groups' definition of income from employment also include employers' social insurance contribution, whereas only the SNA captures imputed contributions to unfunded schemes. Another illustration for a minor difference is that the SNA count 'Investment income attributable to insurance policy holders' as property income (SNA-08: 7.141ff.), whereas it is not practical to collect this information in household surveys. In contrast to the conceptual scope of the Canberra Group includes imputed rent of owner-occupied dwellings as income, LIS has refrained from doing so due to data quality issues (see LIS, 2011 template).

A data confrontation exercise by the Australian Bureau of Statistics showed that only three-quarters of the government pension and allowances recorded in national accounts were also captured by the Survey on Income and Housing (SIH) (McColl et al., 2010).[28] Likewise, in Germany, household surveys capture only approximately one third of the entrepreneurial and capital income recorded in the national accounts (see Braakmann and Schwahn, 2012: 8). A large cross-national study confirmed that household surveys perform particularly poor in capturing income from interest and dividends, as well as 'other' transfer receipts (Fessau et al., 2013). While household surveys are one major data source for compiling National Accounts (see van den Andel, 2012), statistical offices also have access to a wide range of administrative data such as the records of social insurance institutions. Using national accounts, rather than household surveys, to measure the size of redistribution should therefore drastically reduce measurement error.[29]

Compared to the substantial heterogeneity in the methods used for household surveys, national accounts also have the advantage that the same concepts are applied for a very long time and across countries (see Bos, 2007). This makes users "reasonably confident that the data correspond to the underlying analytical concepts, that they are constructed by national statistical agencies in a consistent way over time, and that […] they are in principle comparable across countries" (Atkinson and Brandolini, 2001: 771). However, there are two major potential limitations to data comparability: Firstly, not all countries compile data for the household sector (S.14), but some tabulate households jointly with Non-profit institutions serving households (NPISHs) (S.15). Secondly, the revisions of the SNA guidelines can lead to series breaks in national accounts as a country adopts a new standard. Both issues will be revisited later.

3.2. Indicator construction: Using national accounts to measure the size of redistribution

The main disadvantage of the SNA for scholars of comparative political economy is that it is descriptive, not analytical. In other words, to better understand economic and social processes it is necessary to derive indicators by "simply rearranging the basic standard national accounting concepts" (Bos, 2007). The United Nations (2015) does this in the 'Analysis of Main Aggregates' for common statistics such as GDP growth, but does not provide a ready-made indicator for redistribution. However, the national accounts contain all the main ingredients: primary incomes, flows of taxes and transfers, and disposable household income. Rearranging these concepts can produce answers to different analytical questions, for instance whether households in their totality are better off before or after redistribution (providing for a more balanced measure than the conventional 'tax wedge' estimates). The objective of this paper is narrower, namely to derive an indicator for the size of redistribution through taxes and transfers that can usefully complement the established LIS-based indicator that captures their effect on income inequality.

A first major decision concerns the scope of the proposed indictor for the size of redistribution: should it capture the entire redistributive process, or only government redistribution? In other words, are private redistributive flows 'noise' or 'signal'? When constructing the 'change in Gini'-indicator, Mahler and Jesuit (2006) follow the 'noise' approach and use 'private sector incomes' as their measure of pre-redistribution incomes. In addition to primary incomes, they add receipts of

[28] Most of the shortfall was due to differences in scope, namely the exclusion of pensioners in public care homes and people remote indigenous communities (ibid.).

[29] By contrast, Mahler and Jesuit (2006) compute the 'average size of social transfers as a proportion of households' pre-tax income' on the basis of LIS data.

private pensions, public sector occupational pensions and other private transfers to the pre-tax pre-transfer income aggregate.[30] In comparing this to disposable incomes, they therefore derive a 'pure' measure of the effect of government fiscal redistribution that excludes private flows. The present paper will adopt the opposite approach and treat private transfers as a 'signal' that is of analytical interest. This allows, for instance, discerning how the relative weight of private and public transfer systems has evolved over time. It also answers to the criticism that comparisons based on fiscal redistribution alone overstate cross-national differences, given that some countries have delegated social insurance functions to the private sector and that inter-household support plays a major role in developing countries (see e.g. Cox et al., 2004).

[*Table 2 about here*]

Table 2 therefore re-orders the now-familiar items from the secondary distribution of income account to distinguish between those where the counter party is the government or a social insurance scheme[31] and private flows. On this basis, it is straight-forward to calculate government redistribution, private redistribution and total redistribution by expressing the size of these flows relative to the balance of household's primary incomes:

$$Government\ redistribution\ = \frac{\frac{1}{2}(\text{Government taxes and transfers})}{\text{Balance of primary incomes}} \quad (1)$$

$$Private\ redistribution\ = \frac{\frac{1}{2}(\text{Private transfers})}{\text{Balance of primary incomes}} \quad (2)$$

$$Total\ redistribution\ = \frac{\frac{1}{2}(\text{Total taxes and transfers})}{\text{Balance of primary incomes}} \quad (3)$$

To avoid double counting of the flows to and from households, the numerator of all three indicators is multiplied by half. In other words, it is the average of flows to and from households, relative to their primary income (implicitly weighted by primary household income). The indicators will take the value of zero when no redistribution takes place (i.e. in the absence of any flows) and increases as the size of taxes and transfers rises relative to primary incomes. Note that the indicator has no firm upper limit. Hypothetically, it could exceed unity when government collects all primary incomes in the form of taxes and contributions, and then makes disbursements that are greater than the sum of initial primary incomes. The indicator would also exceed unity when transfer receipts are more than twice as large as primary incomes. Although the indicator can be computed when primary incomes are negative, it is not meaningful to do so (a problem that rarely arises in practice).

Since government and private redistribution add up to the total, it is also straight-forward to calculate the share of total redistribution that is attributable to public and private channels. Another extension would be to apply the framework to the tertiary distribution of incomes by adding the receipts of social transfers in kind, and then to calculate broader measures of government and total redistribution (see also Stiglitz et al., 2009: 13; Braakmann and Schwahn, 2012: 11f.). An even more

[30] Private pensions and public sector occupational pensions are already part of the now-obsolete LIS concept 'market incomes'.

[31] Note that government redistribution contains all social insurance schemes where participation is either mandatory, the scheme is operated on behalf of a group, or an employer makes contributions on behalf of an employee (see SNA-93: Annex IV). This is in line with the treatment in LIS, which includes transfers from private insurers through mandatory schemes under 'social security transfers' (LIS, variable definition).

sophisticated approach, pioneered by INSEE (Bellamy et al., 2009), is to build distributional national accounts, which also disaggregate flows by income strata.[32] However, none of these avenues will be pursued here.

As the discussion will have made clear, the proposed indicator meets two of the standards set out above. Firstly, it describes redistributive transactions from the perspective of households and puts them in relation to their primary incomes (and not a conceptually distant aggregate such as GDP). Second, by incorporating taxes and contributions paid as well as benefits received, it captures the entire redistributive process that transforms primary into disposable household incomes. Regarding the third criterion, consistent and comparable measurement, there is reason for optimism – though the impact of different sectoral delimitations and series breaks will have to be investigated in the next section. It might also be useful to re-state that the indicator only captures 'how much' of primary incomes is redistributed, while delegating questions concerning the distributive impact of different tax schedules and expenditure types to others (Martínez-Vázquez et al., 2012).

4. Sources: Data availability and limitations

National accounts are kept by practically all statistical offices, though sometimes in rudimentary form. While production accounts are seen as the indispensable core that even the least developed countries produce, the income accounts are available for a more limited set of countries. Researchers undertaking single-country studies will often be best served by obtaining data directly from national sources (given a greater level of detail and a reduced time-lag)[33], but those who want to undertake a comparative analysis will prefer the convenience of a cross-national data-base. One such source is the National Accounts Official Country Data compiled by the United Nations Statistics Division (UNSD). In what follows, the paper will discuss the data availability from this source, review the two main concerns regarding comparability, and describe how a new secondary data-set for the size measure of redistribution has been constructed on the basis of the UNSD data.

4.1. Data availability

The UNSD data-base contains information on the Secondary Distribution of Income Account in Tables 4.6 and 4.9 (for the narrow and broad household sector, respectively). It contains data from 80 countries and territories, spanning the period from 1950 to 2014.[34] The data-base clearly distinguishes series that differ in terms of conceptual framework (i.e. different revisions of the SNA) and with regard to the inclusion of NPISHs into the household sector. It also labels 'ordinary' series breaks by assigning each series a unique code.[35] On average, for each country or territory, some 3.3 distinct series are available, spanning 14.8 years. This gives a total of 267 series with 3,943 data-points. However, since many of these series overlap, the data-set covers 'only' 1,590 unique country-

[32] While conceptually appealing (see Stiglitz et al., 2009), data availability is still limited (but see Braakmann and Schwahn, 2012, for Germany and Pikettey et al., 2018, for the United States). For an earlier attempt, see Barna (1945).

[33] In addition, data are sometimes available for countries not included in the UNSD database. For instance, Thailand maintains a detailed income account for households and NPISHs, covering 1990 to 2014 (see NESDB, National Accounts of Thailand 2014, Table 45).

[34] In line with the structure of the UNSD database, the Netherlands Antilles, Aruba and Curaçao are counted as three separate entities. However, West Germany (until 1990) and unified Germany are treated as the same entity; Vanuatu is excluded due to data problems.

[35] For series compiled under the SNA-68, the codes have two digits (e.g. 30), for those under the SNA-93 three digits (e.g. 100 or 200) and for series that follow the SNA-08 four digits (1000). Hence, higher series codes generally signal a more recent series.

years. As Figure 1 shows, most of these unique observations are from the early 1990s onwards, while very few countries have time-series that stretch back to the 1950s and 1960s.

[*Figure 1 about here*]

Between the different series, observations for a given country stretch for just under 20 years – though with considerable variation: France (64 observations), Australia (55 observations), and Canada (45 observations) have extended time-series, while there is only a single observation for Trinidad and Tobago; Burundi has only two data-points. The coverage is generally best for the advanced economies, which account for 24 countries in the data-set. This is followed by 20 countries from Eastern Europe and Central Asia (all of them with data starting in 1990 at the earliest)[36] and Latin America and the Caribbean (with 16 countries and territories). Coverage is poorest in the Middle East and developing Asia, where data are available for only nine countries. The data-base covers population giants such as China, India, the United States and Brazil, down to minnows such as the British Virgin Islands or Aruba. Annex 1 gives a detailed matrix of data availability by country.

4.2. Limitations to comparability

As discussed above, the SNA imposes a common set of concepts and definitions that is adhered to internationally.[37] Moreover, revisions are relatively infrequent and the basic concepts have remained constant over time (Bos, 2009: 40). Nonetheless, the cross-national and inter-temporal comparability of data is limited by two important differences: adherence to different revisions of the SNA (which date back to 1968, 1993 and 2008) and two different sectoral deliminations, namely the narrow household sector (S.14) or the broad household sector including NPISHs (S.14+S.15).[38] While there is no quick fix for these conceptual differences, the data allow assessing their likely impact by talking advantage of overlapping observations for the same country and year. Table 3 provides pair-wise comparisons of all observable combinations for the size indicator of 'total redistribution'. This is done by tracking the extent to which two series co-vary (based on the bivariate correlation coefficient) and level differences between two concepts (by simply computing their ratio). The table also lists on how many pair-wise observations the assessment is based.

The results are by-and-large reassuring. Firstly, the bivariate correlation between any two series usually exceeds $r = 0.98$ (with one combination scoring a 'disappointing' $r = 0.979$). This shows that any one series closely tracks any other series. The results are slightly better for government redistribution, with correlation coefficients ranging from 0.9886 to 0.9995 (not tabulated). By contrast, the differences between series are much bigger for private redistribution, with bivariate correlations between 0.710 and 0.925 (not tabulated). This is not surprising, given that the treatment of private transfers in the SNA has undergone much bigger changes. Therefore, changes in definitions are a much greater concern for private than for government redistribution.

[36] This is explained by the fact that the COMECON countries kept their national accounts according to the MPA up to 1990. Also, many of the current countries only came into existence as a result of the break-up of the former Soviet Union and of Yugoslavia.

[37] The two major exceptions are the former COMECON countries that used the Material Product System (MPS) from 1969 until circa 1990 and the United States, where the structure of the National Income and Product Accounts (NIPAs) still differs substantially from the SNA (see Vanoli, 2005: 100ff.; see also BEA, 2017). The European counterpart ESA is based on the SNA (see Eurostat, 2013: 10f).

[38] A detailed discussion of the conceptual differences between revisions can be found in SNA-93 (Annex I) and in SNA-08 (Annex 3).

Secondly, there are level differences between series. These are relatively large when comparing data compiled under the SNA-68 to those that follow the SNA-93 (ratio: 1.10), but much smaller for the remaining combinations. In general, the total redistribution indicator is slightly higher when data are compiled under the SNA-93 and when they refer to the broad household sector (S.14+S.15). Again, this is mainly due to differences in the measurement of private redistribution. Here, the indicator is higher by roughly a third when it refers to the broad household sector. By contrast, level differences are minor for government redistribution under any two combinations of concepts (apart from the SNA-68).

[*Table 3 about here*]

It is always regrettable when conceptual differences lead to noise in the data. However, it is important not to lose perspective. Firstly, transitions from one version of the SNA to the next are a problem that is not unique to the analysis of redistribution. It affects all indicators derived from national accounts, and yet few researchers would refrain from using, say, GDP growth in a cross-country regression. Second, the likely extent and direction of bias is known. This is generally not the case for household surveys, where only a few survey experiments and simulations illuminate the likely bias that is produced by methodological differences (see UNECE, 2011: 101ff.). Thirdly, some statistical offices have retroactively applied the new conceptual frameworks to produce consistent series that extent well into the past. For Canada, the series that complies with the SNA-93 reaches back to 1970; the series under SNA-08 begins in 1981 (see also Lal, 1999).

There are a few options for addressing measurement differences in cross-country analysis. The most radical approach would be to limit comparisons to data that follow a single concept, such as SNA-93 and S.14. However, this would come at the expense of dropping older observations and excluding countries that provide data only for the broad household sector. A second approach would be to include dummy variables whenever a data-point diverges from the benchmark concept (see also Deininger and Squire, 1996: 581ff.). However, this runs danger that substantively interesting information is absorbed by a dummy (for instance, if countries that redistribute less also tend to use different concepts). A third strategy would be to adjust data that do not conform to the benchmark by drawing on the observed, systematic differences between concepts.[39] A fourth, related option would be to impute missing data for the preferred concept, using a multiple imputation procedure. Finally, one can accept the measurement differences as 'noise' and then check in how far they bias results. For instance, if a researcher attempts to show that Anglo-Saxon countries redistribute less, the fact that several of these countries compile data for the broad household sector makes it less likely to confirm the hypothesis.

4.3. Data-set compilation and data anomalies

Researchers interested in redistribution can download the source data directly from the UNSD web-site and compute the size indicator. However, due to the complex structure of the data, this is less straight-forward than it might appear. One major complexity of the data-set is that few countries have a single, consistent time-series. France, Slovakia and Mexico have no fewer than eight different

[39] Using SNA-93 and S.14 as the benchmark, reasonable adjustment factors would be the following: 0.96682 (S.14+S.15); 0.90763 (SNA-68); 1.01544 (SNA-08). Simply multiply the 'non-compliant' observations with these factors, which were calculated as a weighted average of the relevant data from Table 3. However, this implies the assumption that the difference is constant across countries and time, contrary to the warning in Atkinson and Brandolini (2001).

series; Greece holds the record with a total of twelve different series. The data also inevitably contain a few clearly erroneous entries, while other series have missing components (e.g. the balance of primary incomes is not available).[40] All of this makes the raw data difficult to use for those who simply want to include an indicator for size redistribution into a cross-section time-series model. This paper is therefore accompanied by a secondary data-set that does not only contain the 'raw' data, but also a 'primary' series and a version that links different series. While these add to convenience, they come with the usual disclaimers and 'health warnings'.

Of course, which of the available series is best suited crucially depends on the research context. For the accompanying data-set, two principles guided the selection of primary series. Series that refer to the narrow household sector (S.14) were chosen over those also including NPISHs (S.14+S.15). Further, preference was given to the most up-to date series compiled under the SNA-93 (which still provides the greatest number of observations). Exceptions to these two principles were made when an otherwise 'preferable' series lacked some items[41], or the selection of another series allowed for a longer, uninterrupted time-series. This selection protocol yields 1,256 country-year observations from a relatively homogenous set of 'primary' series: 72 series out of 80 series are based on SNA-93, and 71 series refer to the narrow household sector (S.14).[42] All deviations from the benchmark concept are coded with dummies so that researchers can choose their preferred option to address potential bias.

In many instances, additional series provide further data-points. In European countries, the series under SNA-93 typically ends in 2012, while an alternative series under the SNA-08 goes up to 2013 or 2014. Similarly, countries commonly have older series that extend further into the past. The standard methodology used by the OECD and many other organizations is to 'link' these time-series on the basis of a linking factor that is calculated from overlapping observations (OECD, 2004: v-vi). This method adjusts for level differences between series and results in consistent growth rates.[43] In the secondary data-set, applying this method added another 267 data-points to the primary series. However, in a few cases no overlapping periods exist (Russia) or series that are labelled as a single series show large, self-evident breaks (United States). Some 67 observations fall into this category. The secondary data-set highlights these as series breaks, and also identifies linked observations.

A few data 'anomalies' deserve brief mentioning. Some countries record zero values under current taxes paid by households. This was seen as plausible in Bahrain, Saudi Arabia and Qatar (where personal income tax rates are zero), but not in Austria (where an alternative series revealed that households indeed pay taxes). Likewise, some implausible entries in the UNSD data-base for China were in fact errors (see section 5.3). Another unexpected entry concerns small, off-setting flows of social contributions received by households, and matching social benefits paid by households. These are caused by the inclusion of unincorporated enterprises run by households in the household sector, and the re-routing of social contributions. On average, they amount to less than one-

[40] Full documentation of data edits can be found on the first tab of the data-set that accompanies this paper.

[41] An example is Australia's series 300 under the SNA-93 has no information on social contributions and was therefore dropped in favour of series 1000 under SNA-08.

[42] Countries with diverging concepts are as follows: SNA-68 (Bolivia, Côte d'Ivoire, Philippines and Kuwait) and the SNA-08 (Australia, Denmark, Ecuador and New Zealand); S.14+S.15 (Australia, Austria, Canada, Curaçao, Germany, Ireland, Netherlands Antilles, New Zealand and the Republic of Korea).

[43] To maintain consistency, the indicators for government and private redistribution were linked based on separate link factors. These were then summed up to give total redistribution. However, using a separate link factor for total redistribution would have produced a practically identical result.

thousandth of primary incomes (and have no discernible impact on the size indicator). By contrast, for Australia and Canada, the UNSD records large receipts of 'social contributions', but no 'social benefits'. These are likely to be classification errors, probably related to the different presentation of the national accounts in both countries (see Lal, 1998). No edits were made in this case and these series were included as detailed in Table 2.

While national accounts data come from trusted, official sources, the quality of data from some developing countries has been found wanting (see Jerven, 2013). Unfortunately, as Bos (2007: 12) observes, "usually no information is provided about the reliability and comparability of national accounts statistics" and data users therefore have to rely on "rather general impression" of data quality. An eye-balling of the data revealed no suspicious-looking observations for the old OECD countries and for developing countries with sophisticated statistical systems (such as Brazil, South Africa and Mexico). Plausible, consistent time-series are also found in many other developing countries, while larger year-on-years swings were evident, for instance, in Bolivia, Mongolia and for countries that emerged from the Soviet Union (in particular for the early 1990s). It is difficult to assess whether these are due to real, underlying changes or whether they are artefacts of poor measurement. Note that the countries with the weakest statistical capacity usually concentrate on estimating main aggregates (such as GDP), and are hence absent from the secondary data-set.

A more formal approach to assess the quality of the data is to evaluate their internal consistency. As can be seen in Table 1, the balancing item (Gross Disposable Income) should be equal to the sum of the 'use' and 'resource' items in the same account. This was the case for 1,246 of the 1,256 observations from the primary series (allowing for a tolerance of 0.1 per cent for rounding errors).[44] While this is encouraging, it does not exempt users from their duty to know their data and to check in how far results could be driven by erroneous data.

5. Taking a peek at the data: anything new?

Does the new indicator for the size of redistribution offer us any new insights or can it help to corroborate existing knowledge on redistribution and welfare states? This section will take a peek at the data to give an impression of potential applications. It starts by presenting government redistribution in a large cross-section of countries, and then presents time series for the group of seven advanced economies, contrasting it with the established social expenditure indicator. It then devotes some time to China, a country that is of great interest to researchers and presents formidable data challenges. The discussion will necessarily remain illustrative in nature, and only scratch at the surface of what is a rich and complex data-set.

5.1. Redistribution across the world

In the simplest possible model, one could argue that the extent of redistribution is a function of both state capacity and political choice. At one end of the spectrum, a developing country with rudimentary institutional structures has little scope to levy taxes and to distribute transfers (unless they are financed from natural resource windfalls or development assistance). As state capacity expands, this constraint is gradually lifted and it becomes increasingly feasible for governments to

[44] Countries with larger deviations were the following: Bahrain (2010, 2012 and 2013), British Virgin Islands (1999), Canada (1970-74) and Mongolia (2012). Likewise, the earlier series for New Zealand (1986-97) does not balance. These and all other data points that exceed the tolerance limit of 0.1 per cent are marked as 'fail' in the secondary data-set. A discrepancy for China could be corrected based on national data (see section 5.3).

appropriate and redistribute resources. However, administrative viability does not imply political expediency – it simply opens up the choice for polities to use the tax and transfer system to intervene into the distribution of household incomes. What determines these choices is of course topic of a large body of literature, and the set of feasible options may be constrained by an institutional path chosen at some stage in the distant past (see Beramendi et al., 2015).

Motivated by this reasoning, Figure 2 plots the new size indicator for government redistribution against GNI per capita, which serves as a rough proxy for state capacity. None of the six countries with per capita incomes below 800 US dollars (all of which are francophone countries from Africa) carries out any meaningful redistribution: the size indicator ranges from 0.7 per cent of households' primary incomes in Guinea to 3.0 per cent in Cameroon. But how about other developing countries, given several of them initiated new anti-poverty programmes over the past two decades?

[*Figure 2 about here*]

The two best-known examples are, no doubt, from Brazil and India. In Brazil, the government has devoted significant resources to *bolsa familia*, a conditional cash transfer programme, and two largely tax-financed social pension schemes that between them amounted to 2.6 per cent of GDP in 2010 (see Barrientos, 2013: 894). The expansion of these programmes helps to explain why government redistribution rose from 20.7 per cent of primary incomes in 2000 to 24.8 per cent in 2009. With equal ambition, India has allocated roughly 0.5 per cent of its GDP to the National Rural Employment Guarantee Scheme (NREGA).[45] However, this had no discernible effect on the government redistribution indicator, which stood at a minuscule 1.4 per cent in 2012. This is due to two reasons: Firstly, India does not tabulate social benefits and social contributions separately, but groups all transfers under 'other transfers'. This means that social assistance programmes are only captured by the total redistribution indicator (which stood at 6.0 per cent). Secondly, and more importantly, NREGA does not actually pay any transfers to participants, but wages – which are primary incomes. Given that *bolsa famila* and NREGA have both been credited with reducing income inequality, an intuitive criticism would be that the new indicator unfairly 'penalizes' India. However, to cut the discussion short, it is worth recalling that the indicator only aims to measure direct fiscal redistribution; it does not claim to capture Hicks' and Swank's (1984a) broader concept of redistribution (which would also include the effects of Brazil's minimum wage increases).

Among rich countries, the redistribution indicator shows an even greater dispersion than in the developing world. At a practically the same income level, Cyprus (41.8 per cent) redistributes far more than the British Virgin Islands (5.4 per cent). Likewise, Denmark (46.7 per cent) intervenes heavily into the distribution of household incomes, whereas Australia (15.1 per cent) largely refrains from doing so. In principle, Australia's civil service should be capable of administering a Scandinavian-sized tax and transfer system. If lack of administrative capacity is not a reason for redistributive restraint, political choice is an obvious alternative explanation. Why some countries chose to redistribute incomes while others do not is of course a key problem analysed by the political economy literature (see McCarty and Pontusson, 2011). While this question cannot be addressed here, Figure 2 shows a pattern that is familiar from the comparative welfare state literature: On average, social-democratic welfare states redistribute most (43.0 per cent) and liberal regimes least

[45] Data refer to fiscal year 2010-11, based on Sharma (2011: 287) and United Nations (2014).

(29.7 per cent), while the continental model has an intermediate position (37.0 per cent).[46] However, the division is by no means clear-cut: There is little difference between Norway (social-democratic) and Switzerland (liberal).

5.2. Trends in the G-7 countries

The different trajectories that advanced economies took are also evident from Figure 3. The most impressive time-series is from France and portrays the evolution of the country's tax and transfer system since 1950. The most rapid acceleration in redistribution occurred from the mid-1970s to the mid-1980s, although the ratio kept rising throughout Mitterrand's tenure as president. While broadly stable under Chirac, the extent of redistribution recommenced its rise in 2008. Italy and Japan stand out as the two other G-7 countries where fiscal redistribution has continually increased since 1980. Although Japan's taxes and transfers are still modest at 27.9 per cent of primary incomes, their continued growth sits uneasily with the common classification of the country as a 'liberal' welfare state. Somewhat counterintuitively, the extent of fiscal redistribution is now almost two percentage points higher in the United Kingdom, supposedly a liberal welfare state, than in Germany, a continental welfare state. While the overall change since the 1980s has been small in both countries, the ups and offer some interesting insights: In the United Kingdom, the pattern – retrenchment under Thatcher and Major, expansion in the second half of Labour's period in office – roughly corresponds to the political orientation of governments. By contrast, in Germany the changes appear to be largely driven by the economic cycle, with little evidence of partisan effects.

More in line with perceived wisdom, fiscal redistribution has remained fairly marginal in the United States and Canada (at just over 20 per cent of primary incomes). While in Canada taxes and transfers rose quite significantly from 1970 until the early 1990s (under liberal and conservative governments alike), in the United States the growth of redistribution already stalled in the early 1980s when Ronald Reagan took office (and has crept upwards only incrementally ever since). While it is beyond the scope of this paper to disentangle partisan effects from demographic and cyclical influences, the glimpse at the time-series illustrates that the data might contain interesting answers. Having annual observations (rather than surveys several years apart) is an especially useful feature for those who want to undertaking cross-section time-series econometric analysis.

[*Figure 3 about here*]

Of course, what has been said above is not entirely new – the comparative welfare state literature has studied these trends and cross-national differences extensively. The novelty of the indicator is that the extent of redistribution, and by implication the size of the welfare state, is mapped from the perspective of households, and not seen through the more traditional lens of government expenditure (see Stiglitz et al. [2009] or Castles [2011] on why such a shift should be welcome). Figure 4 plots the new size measure for redistribution against the traditional welfare state indicator, public social expenditure as fraction of GDP. It again covers the G-7 countries, beginning in 1980 (the earliest point in time available from the OECD's SOCX data-base).

The first impression is that the two indicators correlate closely (and the bivariate correlation on pooled observations is indeed $r = 0.902$, significant at the 0.001-level). For France, Italy and Japan, the two indicators tell very similar stories about greater government intervention into household

[46] See Esping-Andersen and Myles (2011) for a comprehensive summary.

incomes. While the lines are relatively straight, a few 'knots' mark periods of stagnation – for Japan in the late 1980s and for France in the second half of the 1980s and again from 2003 to 2008. In Canada, welfare state expansions came to a halt in the early 1990s. By contrast, the lines for Germany, the United Kingdom and the United States are more 'meandering' throughout, giving the impression of a wool hank. In all three cases, social expenditure varied much more than the extent to which the state intervened into household incomes. Intriguingly, social expenditure is consistently higher in Germany than in the United Kingdom, by a margin of some five percentage points of GDP. However, there is no difference in the extent of the state's interventions into household income. Conversely, the traditional social spending indicator understates the difference between an 'interventionist' United Kingdom and the truly 'lean' states in the United States and Canada.

[*Figure 4 about here*]

In sum, adopting the perspective of households confirms some of the established findings of the welfare state literature, but challenges others. Measured by the size of taxes and transfers relative to household's primary incomes, the United Kingdom is far less 'liberal' its overseas offspring – and appears to be rather 'continental' European.[47] Arguably, it is a desirable property of an indicator if it can produce such insights and provoke new lines of inquiry. At the same time, it offers a degree of reassurance and cross-validation if the indicator does not stray off too far from related measures.

5.3. A country case-study: Redistribution in China

In contrast to the relative abundance of data sources for the advanced countries, researchers looking for data from China face greater challenges. A first point of call is the LIS, which has recently added a data for 2002, 2007 and 2013. However, these are not the official household survey data from the Chinese National Bureau of Statistics (NBS), which are not accessible to the public (see Ravallion, 2015). Instead, LIS relies on the well-regarded Chinese Household Income Project (CHIP) which is led by Beijing Normal University. LIS classifies the income concept of this data-set as 'mixed' because 'taxes and contributions [are] insufficiently captured'.

[*Figure 5 about here*]

At first sight, researchers are better served by the SWIID, which provides MI estimates for the change in inequality due to redistribution from 1985 to 2013 (see Figure 5). Although the range of the MI estimates is wide, the average consistently shows relative redistribution of around five per cent throughout the 1980s and early 1990s, followed by a decline in the early 2000s and a violent swing into negative territory from 2006 onwards. How plausible are these conclusions? While the CHIPs data (which are used by LIS) lack comprehensive information for rural households, a careful analysis by He and Sato (2011: 322) shows that the tax and transfer system substantially reduced inequality among urban residents. They estimate relative redistribution at 26.3 per cent in 1995 and 25.3 per cent in 2002 – far outside the range of the SWIID estimates. If the imputations in the SWIID are difficult to square with the available CHIPs data, the finding that taxes and transfers exacerbated inequality from the mid-2000s onwards is even more mysterious.[48]

[47] Admittedly, for the same size of intervention, the United Kingdom is somewhat worse in reducing income inequality, with relative redistribution of 0.397 in 2010, compared to 0.448 in Germany in the same year (based on Thewissen et al., 2016).

[48] Ferreira et al. (2015: 519ff.) report a similar discrepancy for Armenia where SWIID shows negative redistribution, but actual survey data confirm that taxes and transfers reduced (rather than exacerbated) income inequality.

Does Jenkin's (2015) advise to refer back to the original WIID data offer relief? The WIID (version 3.4), which is one of the primary sources of the SWIID, indeed contains observations from China that are labelled either as 'gross' or 'disposable' for the 1980s and early 1990s. All of the 'gross' observations are marked as 'low quality' and were carried over from the compilation by Deininger and Squire (1996). They in turn drew on an unpublished paper by 'Ying 1995', who consolidated them from separate tabulations for rural and urban households in China's Statistical Yearbooks (SYB). However, in the case of rural households, the SYB only contains information on net incomes (see for instance NBS, 1998: 344). Hence it is impossible to derive a 'gross' Gini for China from the SYB. The 'All the Ginis'-dataset[49] (also used in the SWIID) has similar problems: observations from Deininger and Squire (1996) and the WIID are labelled as 'gross', but those from Wu and Perloff (2005) as 'net' – although all of them ultimately rely on SYB tabulations. Therefore, it is quite possible that the different labelling of the same underlying data has been (mistakenly) picked up as substantive information in imputations of the SWIID (see the discussion in Solt, 2016).

[*Figure 6 about here*]

As this excursion has shown, following the advice Atkinson and Brandolini (2001) to trace the 'gene-alogy' of secondary data-sets can be enlightening. Unfortunately, a parallel exercise for the national accounts data illustrates similar pitfalls. For China, the UNSD database contains a time-series from 2000 to 2011 (series code 300). It is based on the latest revision of China's 'Flow of Funds' account, but UNSD data on primary incomes diverge from the original NBS data in 2000. More difficult to detect was a discrepancy in 2010 and 2011, where the UNSD – deviating from previous practice – counted 'Allowances' under social benefits, and not under 'other current transfers'. Both errors were corrected.[50] Even more problematic is the earlier series (series code 100), which is based on a previous revision by the NBS (1999: Table 3-21 to 3-29). Somewhat inexplicably, the UNSD omits two important items altogether: receipts of social benefits (item code 20) and other current transfers (item code 21). As a result, the account does not balance and the error is easily detected; the missing data can be added from the original source. Even though such inconsistencies are the exception (see the discussion above), the Chinese example confirms that researchers are well-advised to go back to primary sources when irregularities raise warning flags.

In contrast to the SWIID imputations, the national accounts (once corrected for obvious errors) show a steady expansion of redistribution since the turn of the millennium (see Figure 6). This is in line with the extension of social security in China over the past two decades, such as the nation-wide introduction of the Minimum Livelihood Guarantee Programme in 1999 (see Ravallion, 2014). Although the conceptual difference between private and government redistribution is clear in the SNA (see Section 3), this distinction is more blurred in China. The source data from the NBS show that roughly half of the nominally 'private' transfers are allowances that originate from government or NPISHs (which are tabulated jointly in China; see Xu et al., 2012: 16). In sum, the size indicator tells a plausible story about the expansion of redistributive government intervention, but it does not make household surveys redundant. Only they can tell who benefited from redistribution – urban residents

[49] Version as of autumn 2014, accessed on 28 July 2016 at http://go.worldbank.org/9VCQW66LA0 .

[50] See the revised version published in the 2010 and 2012 editions of the Statistical Yearbook (NBS, 2010 and 2012). The NBS (2014 and 2015) has also published data for 2012 and 2013 that are still missing in the UNSD data-base. Xu et al. (2012) provide a discussion of the historical evolution of China's 'Flow of Funds' account and its relation to the SNA-93.

or those with a rural household registration – and how effective government intervention is in containing the rapid rise in China's income inequality.[51]

6. Conclusions: Applications for the size indicator of redistribution

This paper made the case that fiscal redistribution can be usefully measured both in terms of the size of the government's intervention and its effect on income inequality. However, while the early literature was concerned with both aspects in roughly equal proportion, there is now a near-universal consensus to measure redistribution as the change in the Gini coefficient. This shift has mostly happened for pragmatic reasons, driven by the increased availability of harmonized household surveys that allow comparing inequality before and after taxes and transfers (notably from LIS). In addition, there were good reasons to abandon the established size indicator, public social expenditure as a percentage of GDP, given its flaws as a proxy for redistribution.

None of this makes the analytical distinction between size and effect is conceptually invalid. On the contrary, the literature on redistribution stands to gain from clarifying whether a given research questions is best addressed as 'How much does the state redistribute?', or as 'How effective are states in reducing inequality?'. Often, the relationship between the size of an intervention and the subsequent distributive outcomes is itself of interest – in other words, the efficiency of the intervention. Against this background, the main objective of this paper was to construct a new indicator for the size of redistribution that can complement the established LIS-based measure that track the change in income inequality. Three principles guided the indicator construction: Firstly, redistribution concerns household incomes and should hence be approached from the perspective of households. Secondly, the indicator should capture the entire process that transforms primary incomes into disposable incomes. And thirdly, measurement should be as fully consistent as possible across countries and time.

It was argued that national accounts, an underutilized data-source, provide a good starting point to measure the size of redistribution. The 'Secondary distribution of Income Account' allows tracking how the primary incomes of households are transformed into disposable income, detailing the amounts of benefits and transfers that are received by households and the taxes and social contributions paid. Rearranging these items gives rise to three related indicators for the size of government, private and total redistribution. The concepts used in the SNA-93 mean that the new size indicator meets the first two principles outlined above. The SNA also imposes a common structure on the data and a common set of definitions that is stable over long periods of time, a good precondition for meeting the third criterion. Moreover, the concepts used in national accounts correspond well to those that guide data collection in household surveys (UNECE, 2011).

While the new indicator can be usefully applied to data from national sources, it is a convenient that the UNSD maintains a large repository of national accounts statistics. Raw data from this source form the basis of a new secondary data-set. It contains 1,590 unique country-year observations from 80 countries and territories, in some cases stretching back as far as 1950. It is easy to see the appeal of such a large, unexploited data source – especially in light of the common assessment that "data are particularly scarce and unreliable for redistribution" (Ostry et al., 2014: 7). China is a good example to illustrate this point: the available LIS-based secondary data-sets contain no information on relative

[51] The latest official figures place the Gini coefficient for disposable incomes at 0.462 (NBS, 'China's Economy Realized a Moderate but Stable and Sound Growth in 2015', Press Release dated 19 January, 2016).

redistribution (the change concept) in China, while the available time-series estimates from the SWIID diverge substantially from the two data-points that can be derived from survey data. However, the case of China also illustrates that the UNSD data-base contains errors and that cross-checking it against national sources is valuable advice in case of inconsistencies.

So far, the proposed size indicator mainly placed within the literature on redistribution and comparative political economy. However, taking a step back, a number of potential applications in neighbouring fields come to mind:

(a) The literature on *state intervention* has focused on issues such as corporate taxation, public expenditures, privatization and public ownership, and the regulation of product and labour market. Measuring the extent to which the state intervenes into household incomes through taxes and transfers would add a relevant dimension.

(b) When studying the effects of redistribution, the *growth literature* is faced with the conundrum that large tax and transfer flows are seen and harmful for growth, while greater equality is thought to promote social stability and growth (see e.g. Ostry et al., 2014). Here, it should be useful to measure the degree of government intervention independently of its equalizing effect.

(c) Within *development studies*, the potential of redistribution to alleviate poverty has entered the mainstream – partly as a result of the disappointment with previous 'trickle down'-approach (see White, 2001). Although the data availability is modest, the size indicator can demonstrate that some developing countries increasingly engage in redistribution (whereas others don't).

(d) The *welfare state literature* could benefit from analysing transfer spending not only from the perspective of government, but also through the lens of households. As the example of the United Kingdom shows, some supposedly 'liberal' regimes intervene far more into household incomes than the conventional measures based on social spending would suggest.

(e) Lastly, the *literature on globalization and taxation* has struggled with two competing hypothesis, namely that (a) globalization has eroded the state's capacity for taxation and social benefits or, conversely, that (b) states can only maintain political support for openness if they provide a generous safety net. Can the size measure provide any new insights?

None of these questions have been addressed in the current paper. However, the hope is that others will pursue them and that this paper provides some useful foundations for the informed use of the proposed size measure of redistribution.

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Table 1. Schematic presentation of the 'Secondary distribution of income account' (Account II.2) for the household sector (S.14) under the SNA-93

Resources / Uses side	Transactions and balancing items	SNA-93 Item Code	UNSD Item Code
Resources	*Balance of primary incomes, gross*	*B.5g*	*18*
Resources	[Social contributions]	D.61	19
Resources	Social benefits other than social transfers in kind	D.62	20
Resources	Other current transfers	D.7	21
Uses	Current taxes on income, wealth, etc.	D.5	22
Uses	Social contributions	D.61	23
Uses	[Social benefits other than social transfers in kind]	D.62	24
Uses	Other current transfers	D.7	25
Balancing item	*Disposable income, gross*	*B.6g*	*26*

Note: Items have been re-ordered to match the data-base structure of UNSD, National Accounts Official Country Data (Tables 4.6 and 4.9). Items which are generally not applicable to households are in [brackets]. 'Resources' stands for amounts receivable by households, 'uses' for amounts payable.

Source: Adapted from SNA-93 and UNSD, National Accounts Official Country Data (Tables 4.6 and 4.9).

Table 2. Classification of transaction according to government and private redistribution

Resources / Uses side	Transactions and balancing items	SNA-93 Item Code	UNSD Item Code
1. Government taxes and transfers, as the sum of:			
Resources	[Social contributions]	D.61	19
Resources	Social benefits other than social transfers in kind	D.62	20
Uses	Current taxes on income, wealth, etc.	D.5	22
Uses	Social contributions	D.61	23
Uses	[Social benefits other than social transfers in kind]	D.62	24
2. Private transfers, as the sum of:			
Resources	Other current transfers	D.7	21
Uses	Other current transfers	D.7	25
3. Total taxes and transfers = Sum of 1. and 2. above			

Note: Items which are generally not applicable to households are in [brackets]. 'Resources' stands for amounts receivable by households, 'uses' for amounts payable.

Source: Adapted from SNA-93 and UNSD, National Accounts Official Country Data (Tables 4.6 and 4.9).

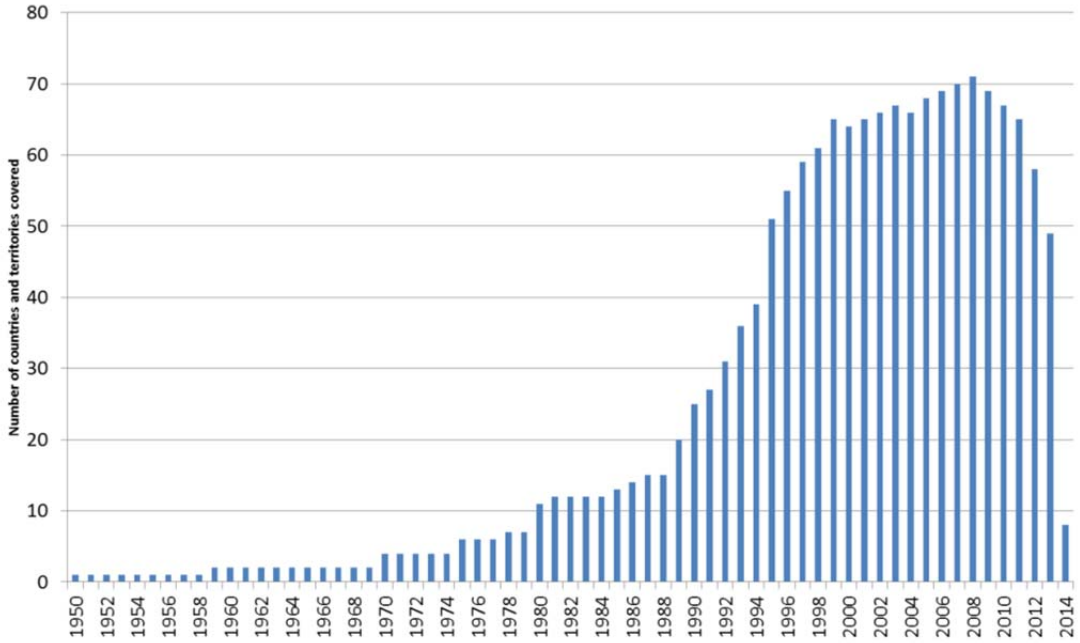
Table 3. Pair-wise comparison of matched observations with different measurement concepts, total redistribution

	SNA-68 (S.14)	SNA-68 (S.14+S.15)	SNA-93 (S.14)	SNA-93 (S.14+S.15)	SNA-08 (S.14)	SNA-08 (S.14+S.15)
SNA-68 (S.14)	1.0000 1.0000 n = 88					
SNA-68 (S.14+S.15)	.. .. n = 0	.. .. n = 0				
SNA-93 (S.14)	0.9913 1.1017 n = 190	.. .. n = 0	1.0000 1.0000 n = 958			
SNA-93 (S.14+S.15)	.. .. n = 0	.. .. n = 0	0.9948 0.9678 n = 424	1.0000 1.0000 n = 676		
SNA-08 (S.14)	.. .. n = 0	.. .. n = 0	0.9874 1.0216 n = 330	0.9862 1.0465 n = 251	1.0000 1.0000 n = 389	
SNA-08 (S.14+S.15)	.. .. n = 0	.. .. n = 0	0.9793 0.9861 n = 252	0.9920 1.0104 n = 409	0.9959 0.9653 n = 271	1.0000 1.0000 n = 495

Note: The table gives the bivariate correlation between observations for the same country and year under different measurement concepts (first line), the average ratio of the observations where the concept in the column heading is the numerator and the concept in the row title is the denominator (second line) and the number of observations in each pairing (third line). For each country, only one series was used per measurement concept. Series with missing items were excluded. SNA-68, SNA-93 and SNA-08 refer to the respective revision for the System of National Accounts; S.14 refers to Households, S.14+S.15 refers to Households and Non-profit institutions serving households (NPISHs). All correlation coefficients are significant at the 0.001-level.

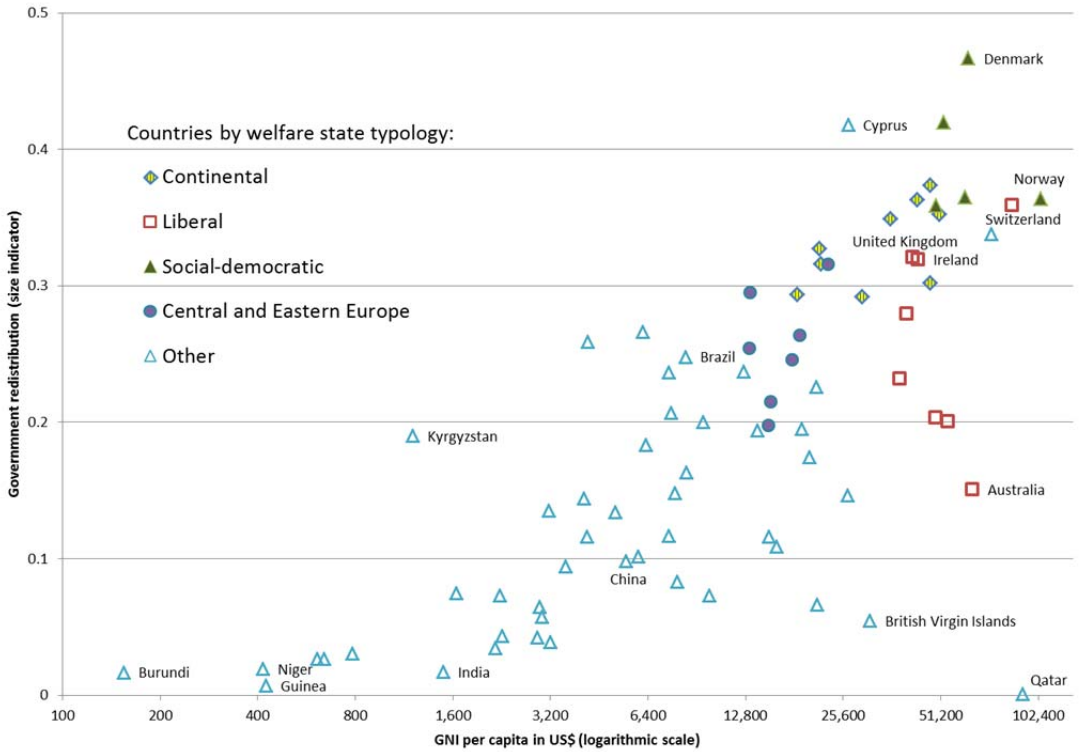
Source: Based on UNSD, National Accounts Official Country Data (Tables 4.6 and 4.9).

Figure 1. Availability of data for size redistribution from the National Accounts by year, 1950-2014



Source: Based on UNSD, National Accounts Official Country Data (Tables 4.6 and 4.9).

Figure 2. Government redistribution and GNI per capita across countries by welfare state regime, last available year (circa 2010 to 2014)

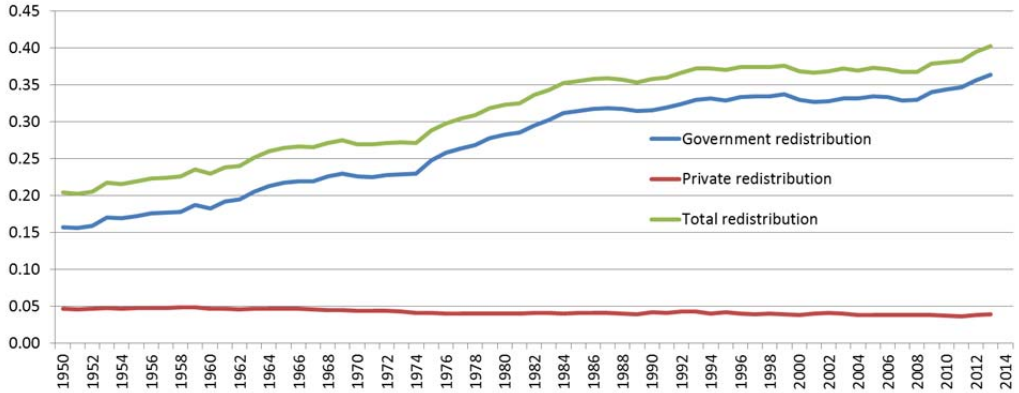


Note: For indicator definition, see Section 3. Reference years for the most recent observation can be found in Annex 1. The classification of countries by welfare regime is from Ebbinghaus (2012: 15).

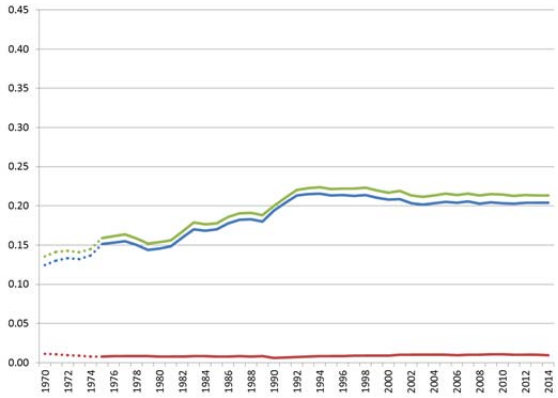
Source: Based on UNSD, National Accounts Estimates of Main Aggregates and National Accounts Official Country Data (Tables 4.6 and 4.9).

Figure 3. The size indicator for redistribution in G7 countries, 1950 to 2014

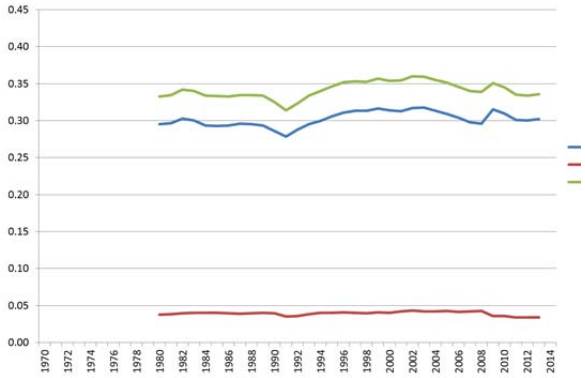
France



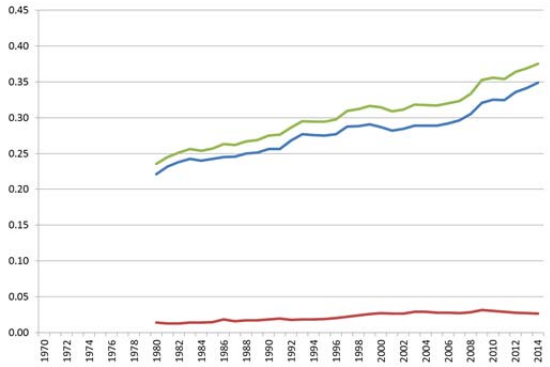
Canada



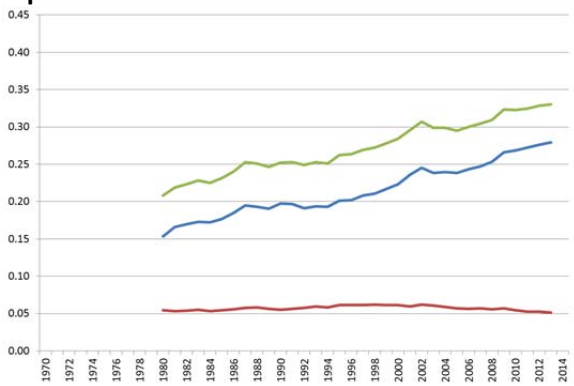
Germany



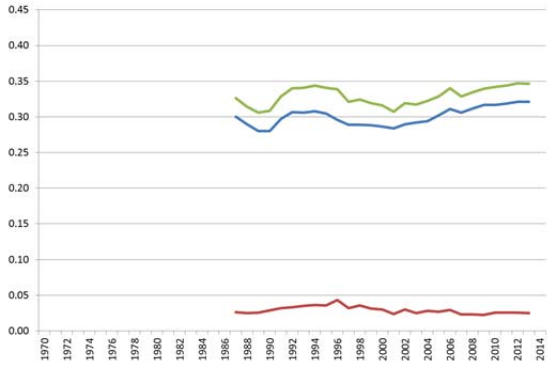
Italy



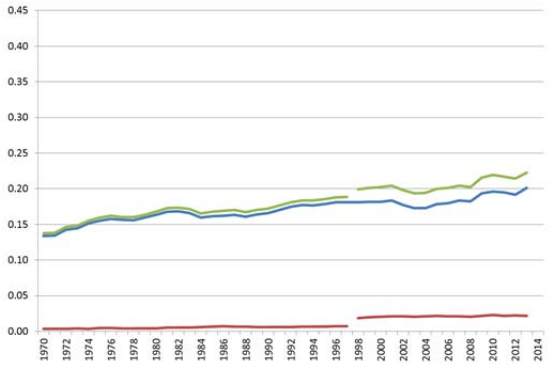
Japan



United Kingdom

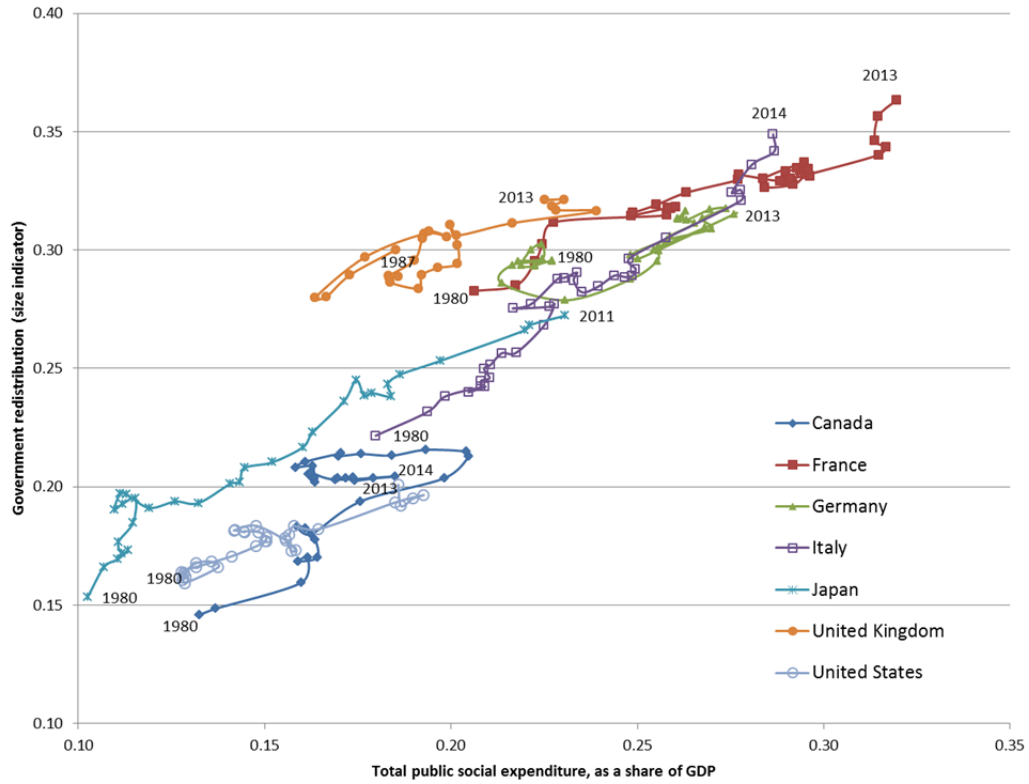


United States



Note: For the definition of the indicator, see section 3 of this paper. The primary series used were all compiled under SNA-93; they refer to the household sector and NPISHs (S.14+S.15) in Germany and Canada and the narrow household sector (S.14) in the remaining countries. Data include linked series; data for Canada (1970-1974) show inconsistencies.
Source: Based on UNSD, National Accounts Official Country Data (Tables 4.6 and 4.9).

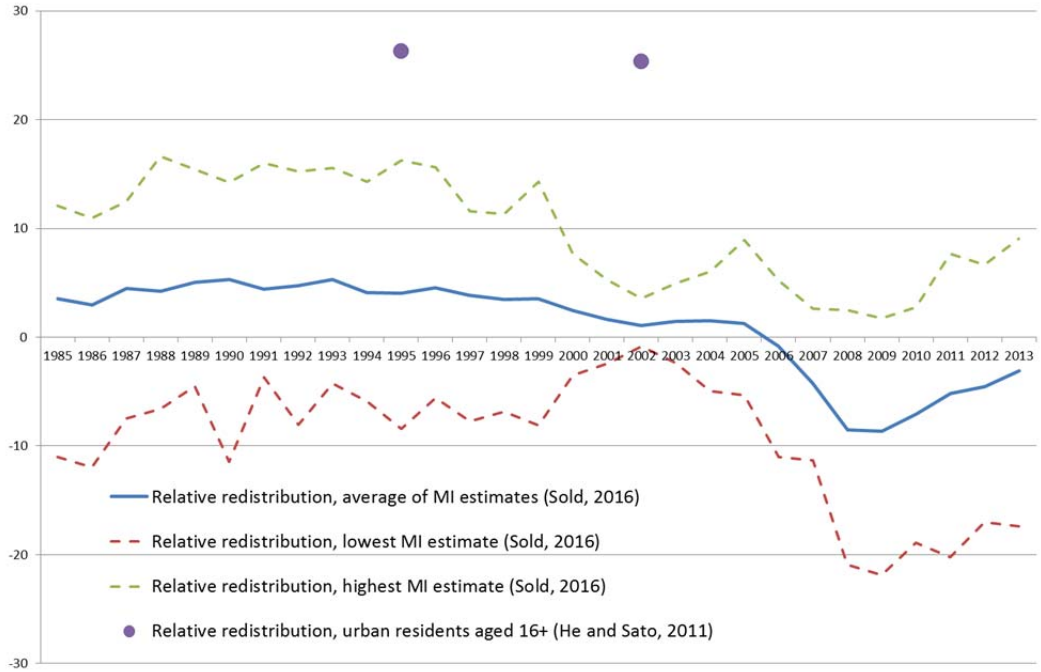
Figure 4. The size indicator for redistribution and public social expenditure in G7 countries, 1980 to 2014



Note: For indicator definition, see Section 3 and Adema et al. (2011).

Source: Based on UNSD, National Accounts Official Country Data (Tables 4.6 and 4.9) and OECD, SOCX database (Total public social expenditure, in per cent of GDP).

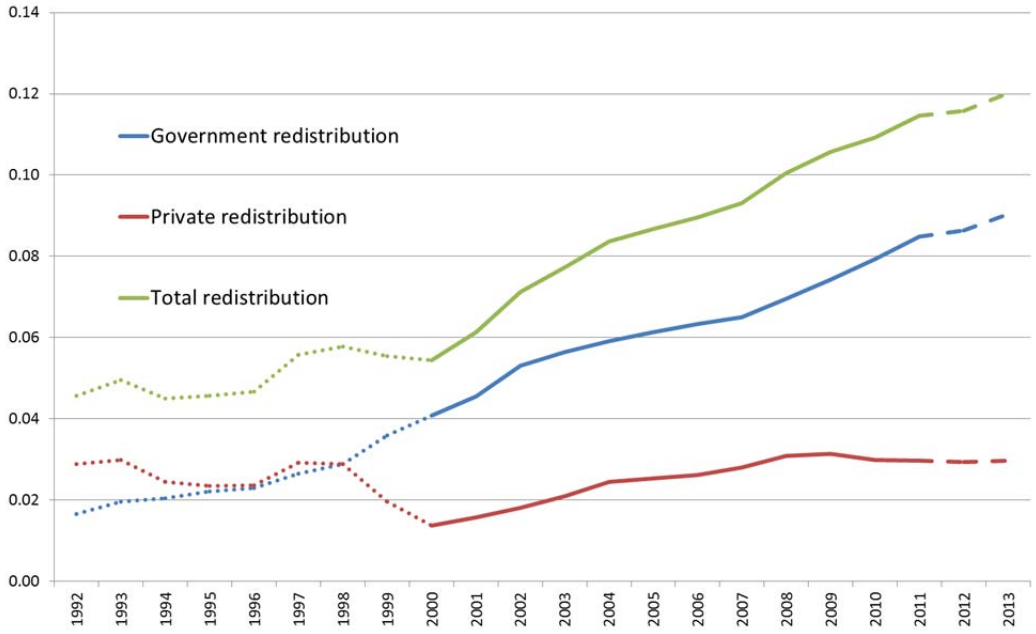
Figure 5. Available estimates for relative redistribution (change indicator) in China, 1985-2013



Note: Relative redistribution is defined as the reduction in the Gini coefficient due to taxes and transfers as one moves from the inequality of market incomes to the inequality of disposable income, relative to the initial level of market inequality.

Source: See Solt (2016), SWIID version 5.0; He and Sato (2011: 322).

Figure 6. The size of redistributive interventions in China based on national accounts, 1992-2013



Note: For explanation of the indicator, see Section 3. The solid line is based on Series 300 in the UN data-base (SNA-93, S.14). Data prior to 2000 are linked observations; data from 2012 and 2013 are added from national sources.

Source: UNSD, National Accounts Official Country Data (Table 4.6); NBS, China Statistical Yearbooks for 1999 (Table 3-21 to 3-29), 2000 to 2003 (Table 3-21) and 2004 to 2005, Table 2-23) and online data-base accessed at http://data.stats.gov.cn on 28 June 2016.

Annex 1. Main characteristics of the secondary data-set on the size of redistribution

Country or territory	Number of observations	Thereof:			Year of earliest observation	Year of latest observation	Properties of primary series	
		Primary series	Linked series	Unlinked series			SNA revision	Sector coverage
Armenia	23	16	3	4	1990	2012	SNA-93	S.14
Aruba	7	7			1995	2001	SNA-93	S.14
Australia	55	55			1959	2013	SNA-08	S.14+S.15
Austria	19	18	1		1995	2013	SNA-93	S.14+S.15
Azerbaijan	24	14	10		1990	2013	SNA-93	S.14
Bahrain	6	6			2008	2013	SNA-93	S.14
Belarus	24	24			1990	2013	SNA-93	S.14
Belgium	29	18	11		1985	2013	SNA-93	S.14
Bolivia	18	18			1997	2014	SNA-68	S.14
Botswana	4	4			1992	1995	SNA-93	S.14
Brazil	15	10	5		1995	2009	SNA-93	S.14
British Virgin Islands	5	5			1995	1999	SNA-93	S.14
Bulgaria	16	11	5		1998	2013	SNA-93	S.14
Burkina Faso	18	13		5	1989	2011	SNA-93	S.14
Burundi	2	2			2005	2006	SNA-93	S.14
Cameroon	8	8			1996	2003	SNA-93	S.14
Canada	45	35	10		1970	2014	SNA-93	S.14+S.15
Chile	18	6	12		1996	2013	SNA-93	S.14
China	20	12	8		1992	2011	SNA-93	S.14
Colombia	20	14	6		1994	2013	SNA-93	S.14
Côte d'Ivoire	12	12			1989	2000	SNA-68	S.14
Croatia	16	8		8	1997	2012	SNA-93	S.14
Curaçao	12	12			2000	2011	SNA-93	S.14+S.15
Cyprus	19	18	1		1995	2013	SNA-93	S.14
Czech Republic	21	20	1		1993	2013	SNA-93	S.14
Denmark	34	20	14		1981	2014	SNA-08	S.14
Dominican Republic	6	6			1991	1996	SNA-93	S.14
Ecuador	7	7			2007	2013	SNA-08	S.14
Egypt	17	6		11	1996	2012	SNA-93	S.14
Estonia	20	13	7		1994	2013	SNA-93	S.14
Finland	39	38	1		1975	2013	SNA-93	S.14
France	64	62	2		1950	2013	SNA-93	S.14
Germany	34	18	16		1980	2013	SNA-93	S.14+S.15
Greece	19	8	11		1995	2013	SNA-93	S.14
Guatemala	12	12			2001	2012	SNA-93	S.14
Guinea	8	8			2003	2010	SNA-93	S.14
Honduras	13	13			2000	2012	SNA-93	S.14
Hungary	19	18	1		1995	2013	SNA-93	S.14
India	15	14	1		1999	2013	SNA-93	S.14
Iran	16	14	2		1996	2011	SNA-93	S.14
Ireland	15	11	4		1999	2013	SNA-93	S.14+S.15
Italy	35	24	11		1980	2014	SNA-93	S.14
Japan	34	20	14		1980	2013	SNA-93	S.14
Kazakhstan	23	20		3	1990	2012	SNA-93	S.14
Korea, Republic of	39	38	1		1975	2013	SNA-93	S.14+S.15
Kuwait	9	9			2002	2010	SNA-68	S.14
Kyrgyzstan	20	20			1994	2013	SNA-93	S.14
Latvia	20	11	9		1994	2013	SNA-93	S.14
Lithuania	19	18	1		1995	2013	SNA-93	S.14
Luxembourg	7	4	3		2006	2012	SNA-93	S.14
Mexico	21	9	12		1993	2013	SNA-93	S.14
Moldova, Republic of	25	25			1989	2013	SNA-93	S.14
Mongolia	9	8	1		2005	2013	SNA-93	S.14

Country or territory	Number of obser-vations	Thereof:			Year of earliest obser-vation	Year of latest obser-vation	Properties of primary series	
		Primary series	Linked series	Unlinked series			SNA revision	Sector coverage
Morocco	16	14	2		1998	2013	SNA-93	S.14
Netherlands	34	33	1		1980	2013	SNA-93	S.14
Netherlands Antilles	13	13			1996	2008	SNA-93	S.14+S.15
New Zealand	27	15	12		1986	2012	SNA-08	S.14+S.15
Nicaragua	6	6			2006	2011	SNA-93	S.14
Niger	20	17	3		1995	2014	SNA-93	S.14
Norway	36	36			1978	2013	SNA-93	S.14
Philippines	16	16			1993	2008	SNA-68	S.14
Poland	23	18	5		1991	2013	SNA-93	S.14
Portugal	20	17	3		1995	2014	SNA-93	S.14
Qatar	12	12			2001	2013	SNA-93	S.14
Romania	25	18	7		1989	2013	SNA-93	S.14
Russian Federation	14	6		8	1992	2013	SNA-93	S.14
Saudi Arabia	8	8			2002	2009	SNA-93	S.14
Serbia	15	15			1997	2011	SNA-93	S.14
Slovakia	21	18	3		1993	2013	SNA-93	S.14
Slovenia	19	18	1		1995	2013	SNA-93	S.14
South Africa	18	17	1		1997	2014	SNA-93	S.14
Spain	19	13	6		1995	2013	SNA-93	S.14
Sweden	22	19	3		1993	2014	SNA-93	S.14
Switzerland	23	15	8		1990	2012	SNA-93	S.14
Trinidad and Tobago	1	1			1999	1999	SNA-93	S.14
Tunisia	20	15	5		1992	2011	SNA-93	S.14
Ukraine	25	17	8		1989	2013	SNA-93	S.14
United Kingdom	27	14	13		1987	2013	SNA-93	S.14
United States	44	14	2	28*	1970	2013	SNA-93	S.14
Venezuela	11	11			1997	2007	SNA-93	S.14
Sum	1,590	1,256	267	67	n/a	n/a	SNA-68: 4 SNA-93: 72	S.14: 71 S.14+S.15: 9
Average	19.9	15.7	3.3	0.8	1992	2011	SNA-08: 4	

* Apparent series break in 1997/98 affects private redistribution and total redistribution, but not government redistribution.

Note: For a complete list of data-edits, please see full documentation of the secondary data-set. S.14 refers to the household sector, S.14+S.15 refers to the household sector and Non-profit Institutions Serving Households (NPISHs).

Source: Based on UNSD, National Accounts Official Country Data (Tables 4.6 and 4.9).