ECONSTOR
Make Your Publications Visible.

A Service of
ZBW
Leibniz-Informationszentrum Wirtschaft
Leibniz Information Centre for Economics

Cai, Yixia; Smeeding, Timothy M.

Working Paper

Deep and extreme child poverty in rich and poor nations: Lessons from Atkinson for the fight against child poverty

LIS Working Paper Series, No. 780

Provided in Cooperation with:
Luxembourg Income Study (LIS)

Suggested Citation: Cai, Yixia; Smeeding, Timothy M. (2019) : Deep and extreme child poverty in rich and poor nations: Lessons from Atkinson for the fight against child poverty, LIS Working Paper Series, No. 780, Luxembourg Income Study (LIS), Luxembourg

This Version is available at:
https://hdl.handle.net/10419/228332

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

WWW.ECONSTOR.EU

Mitglied der Leibniz-Gemeinschaft

LIS
Working Paper Series

No. 780

Deep and Extreme Child Poverty in Rich and Poor Nations: Lessons from Atkinson for the Fight Against Child Poverty

Yixia Cai, Timothy Smeeding

October 2019

Luxembourg Income Study (LIS), asbl

Deep and Extreme Child Poverty in Rich and Poor Nations:
Lessons from Atkinson for the Fight Against Child Poverty †

Yixia Cai
University of Wisconsin-Madison

Timothy Smeeding
University of Wisconsin-Madison

(Version: September 4th, 2019)

† A previous version of this manuscript was presented at the LIS user's conference in honor of Tony Atkinson, May 3-4, 2018. We would like to thank Stephen Jenkins and Anne-Catherine Guio for their comments. The support of the WARF professorship at the University of Wisconsin-Madison is greatly appreciated. All errors are our own. Direct correspondence to Yixia Cai, Institute for Research on Poverty, University of Wisconsin-Madison, 3415 William H. Sewell Social Sciences Building, 1180 Observatory Drive, Madison, WI 53706.
Email: Yixia Cai (yixia.cai@wisc.edu); Timothy Smeeding (smeeding@wisc.edu)

Deep and Extreme Child Poverty in Rich and Poor Nations:
Lessons from Atkinson for the Fight Against Child Poverty

Abstract

The paper documents child poverty levels and trends using both relative ('deep') and absolute ('extreme') measures in two clusters: Anglo–Saxon high-income countries and upper middle-income countries. We also investigate the influence of different components of household income and other resources on child deep-poverty rates to examine the role of the market and the redistributive effects that materialize through private transfers, public benefits, and tax systems on generating poverty reduction. Overall, middle-income nations have witnessed continuous reductions in their extreme child poverty rates, while mild decreases or fluctuations have been observed in the five high-income nations, with the U.S. highlighted by its relatively high rates of deep and extreme poverty regardless of absolute or relative measures and type of equivalence scale used. Private institutions play a larger role in poverty reduction in middle-income nations compared to its impact on developed nations. The degree of dependence on universal or assistance benefits varies among high-income nation. In the U.S., universal programs tend to be meager, while Australian social insurance and universal benefit are robust in their fight against deep poverty. Brazil stands out by its overwhelmingly large proportion of social insurance programs that contribute to improvements of its deep child poverty situation, and South Africa's assistance benefit system performs better in lifting children out of deep poverty.

Keywords: Child poverty, Universal benefits, Social assistance, Cross-national comparison
JEL Classification: I30, I32, I38

1 Introduction

Child poverty has drawn increasing attention from social scientists and policy makers in the past decades. Nations should be judged on how they treat their children, especially those facing the uninsurable risk of being born to parents who are unable or unwilling to support them. A number of studies from developed countries illustrate the negative effects of children living in poverty, especially deep poverty (incomes less than half of the poverty line) on their future development. These include chronic health and psychological problems as well as poor educational attainment compared to their middle class and affluent peers in rich countries (Almond, Currie & Duque, 2018; Magnuson & Votruba-Drzal, 2008; Rainwater & Smeeding, 2003; Smeeding & Thévenot, 2016).

In some less-developed but still rapidly growing nations, extreme child poverty (incomes per person below $2.00 per day) is still a major issue. Although some doubt the goal will be reached, governments around the world have committed to a new set of sustainable development goals (SDGs) that include ending extreme poverty for everyone and everywhere by 2030 (Gertz & Kharas, 2018; World Bank, 2018b). Usually, to examine the extremely disadvantaged, the World Bank conducts studies using spotty microdata and methods that are not used to measure poverty in rich countries, but new efforts on shared prosperity and poverty reduction at higher income and poverty line levels have improved these estimates while generating new challenges for policy and poverty (World Bank, 2018b). In addition, the family size adjustments that were used in earlier reports assume no economies of scale in household consumption. We will also overcome this obstacle in the paper.

Deep and extreme poverty issues have recently surfaced in very rich but unequal nations such as the United States. Nobel laureate Angus Deaton (2018) points to high levels of extreme disadvantage in the United States, citing a stunning UN report on US poverty by Alston (2017), United Nations Special Rapporteur on extreme poverty and human rights. Alston found very poor child conditions such as ringworm and toothless children due to dental decay in his examination of poverty in various areas in the United States. Deaton goes on to compare poverty in rich and poor countries, using a method invented by Allen (2017); Deaton claims that "there are 5.3 million Americans who are absolutely poor by global standards. This is a small number compared with the one for India, for example, but it is more than in Sierra Leone (3.2 million) or Nepal (2.5 million), about the same as in Senegal (5.3 million) and only one-third less than in

Angola (7.4 million)." Approximately half of the people in deep poverty are children (Stevens, 2019). Hence, rich nations are becoming aware of extreme poverty in their midst (see also Edin & Shaefer, 2015).

As major emerging nations experience income growth, they begin to look more like rich Western nations, especially in cities and urban areas and even in remote rural areas. In this paper, we examine child poverty in a set of emerging nations: Brazil, China, India and the Republic of South Africa (RSA), and in another set of large and rich English-speaking nations: Australia, Canada, Ireland, the United Kingdom (UK) and the United States (US). Taken together, these countries include about a third of the world's population and more than 25 percent of all children.

The aim of our paper is to consistently measure relative ("deep") and absolute ("extreme") child poverty in a more global context, using a set of rich and poor nations, and to think about what could be done to alleviate these conditions. Three different institutions (including the market-driven aspect, private redistribution through inter-household transfers, and traditional public redistribution through cash transfers and tax systems) are also recognized, especially because of their differences across nations. The Luxembourg Income Study (LIS) Database (2019) allows us to consistently examine differences in child poverty using multiple poverty measures, multiple periods and a collection of income measures in a fully flexible and comparable way.

The paper is very much in line with Tony Atkinson's concerns for poor children as expressed in his recent research on global poverty with the World Bank, in his work with rich countries such as LIS and his prescriptions for ending poverty among children in all nations (Atkinson, 2015, 2016). We say this knowing that Tony would be aghast at the depth of child poverty that we explore here, far below the 60 percent of national median poverty standards that he repeatedly defended and upheld (e.g. Atkinson, 2015).

We structured the paper as follows. Below we look at the major current child poverty issues in poor and rich nations. The data and methods are presented in the third section, which is followed by results on child poverty levels and trends in 9 countries of interest using both relative and absolute measures from 2002 to the most current year. We also analyze the influence of the different components of household income resources on deep-child-poverty rates in order to examine the role of market and redistributive effects, which materialize through transfers and

child benefits, on poverty reduction. We close the paper with a discussion of the further implications for effective interventions that improve children's life chances in a local context.

2 Background on Issues Surrounding Deep and Extreme Child Poverty

With increasing economic growth, most of the world's poor live in countries that are being reclassified as middle-income countries (MICs) from previous low-income country clusters. More than 70 percent of the global poor live in MICs (Kanbur, 2012; World Bank 2018a). In addition, increasingly, those who are used to living in low-income countries tend to migrate to MICs (Kanbur & Sumner, 2012), making it more promising to tackle child poverty in a global context, as MICs have relatively fewer financial constraints and fiscal dividends from growth that can be sued for reducing poverty among their next generations compared with their low-income counterparts. Our selected nations are excellent examples of this emergence. Table 1 shows the progress of our four emerging nations using the World Bank's 2018 measures for poor or low-income nations (L), lower middle-income nations (LM), upper middle-income countries (UM) and rich countries (R). Brazil, which was LM in 2002, quickly reached UM in 2006 and may soon join the R nations; China went from LM in 2002 to UM by 2010; India has progressed from L to LM between 2002 and 2008 and South Africa jumped from LM to UM and has remained there early in the 2000s.

<Table 1 about here>

Notwithstanding increasing economic growth in these nations, reducing childhood poverty remains a challenge due to less formal and effective social safety net programs in developing countries, and a nontrivial proportion of private transfers flow between households are observed in middle-income countries (Cai & Evans, 2018), which to some extent act as crucial financial support to buffer severe deprivation. According to a report by UNICEF and World Bank Group (2016), over 30 percent of the world's poorest children live in India, struggling with $1.90 or less per person daily[1], and more than 50 percent of the nation's children live in poverty in South Africa. In all of these nations, a high level of resource inequality makes tackling child poverty problems more difficult both due to the high disparity in the distribution of economic resources as well as ethnic and racial differences, especially in India and the RSA.

[1] Even more striking, the share of the world's extremely poor children in Sub-Saharan Africa is approximately 50 percent today.

South Africa remains the country with the highest income inequality in the world and the country with the highest fraction of low-income Blacks (Sulia & Zikhali, 2018).

Poverty rates among children in middle-income countries in the LIS Database have remained overwhelmingly higher than those in high-income countries, using either relative or absolute measures (Gornick & Jäntti, 2012). Still, others have called attention to the role of within-country policies that influence child poverty reduction in LM and UM countries. The positive effects of conditional cash transfer programs in reducing child poverty have been cited in Brazil (Shei, Costa, Reis, & Ko, 2014), South Africa (Engle et al., 2011), and Mexico (Fernald, Gertler, & Neufeld, 2008; Fernald et al., 2009). The targeted policy progress of the Child Support Grant in South Africa has relieved financial stress among impoverished families and improved the well-being of poor children living in such families (SAHRC & UNICEF, 2016). Most recently, the emergence of the welfare state and anti-poverty policy in China has been documented as well as the effects of their national war on poverty (Gao, 2017, 2018).

In rich countries, deep child poverty continues to persist despite the great wealth of others in English-speaking nations. We find an armada of income support and redistribution policies aimed at helping poor children, but not all English-speaking nations provide these. Among the five countries we investigate, all but the US have a universal child allowance. In addition, the UK's war on child poverty is still very robust (Waldfogel, 2010), while Canada has recently introduced a very generous universal child benefit that will almost halve relative child poverty in that nation by the end of 2018 (Corak, 2017).

However, the trend in the US has been the reverse: it has increasingly transferred income support from the desperately poor with little or no earnings to the working poor (Moffitt & Pauley, 2018) and increasingly, work requirements are being added to almost all targeted income support policies for food, housing, and even medical care (Trump, 2018). This phenomenon has also been sparked by the emergence of a study on families with children living on less than $2 per person per day (Edin & Shaefer, 2015). While some question the $2 poverty measure and the length of time a family might be in such straits, there is an emerging belief that instability and lack of access to credit drive many families with children to this position at some point within a given year and that in fact deep poverty is rising (Jencks, 2016).

Moreover, the US's recent call for 'welfare reform' to "promote opportunity and mobility" by testing all programs and reducing access to the already small safety net will

produce even more deeply poor families with children (Trump, 2018). This is especially true among US-born children of immigrants, where the immigrant parents of US citizen children are being removed from the nation and separated from their children (Heinrich, 2018). Hence, the topic of the paper is an important concern in all nations, rich and emerging.

3 Data, Measure and Methods

Our analyses of deep and extreme child poverty throughout the paper are drawn upon harmonized microdata from the Luxembourg Income Study Database (LIS), which has been a pioneer in collecting a series of internationally comparable household survey data. Most recently, the database has expanded its traditional scope of the partner countries from the rich OECD world and included a series of MICs to strengthen its commitment to global poverty and inequality studies (Gornick & Jäntti, 2012; Gornick & Nell, 2017). An additional merit of the LIS database[2] is the detailed disaggregation of social program provisions for each country participating in the database. In this way, we can identify the role of the market and redistributive effects from private transfers, living arrangements, social benefits and the tax system (Gornick & Smeeding, 2018).

We use both relative ("deep") and absolute ("extreme") poverty measures (Smeeding, 2016), comparing and contrasting levels and trends across the 4 emerging nations and the 5 rich ones. We refer to children living in families with incomes below half of the "half median" poverty line (25 percent of median equivalized income) as being in 'deep' poverty, while children living in families with incomes below a fixed dollar line ($2 per person per day in MICs and $6 per person per day in the rich nations) as being in 'extreme' poverty. Below, we describe in detail how we reach those measures of deep and extreme poverty.

For the purpose of comparability, the analysis sample consists of country data starting in the year 2002 and continuing to the most recent year available. Only households with children less than 18 years old are included when calculating the proportion of children living in poverty. Poor children are defined as those living in households whose income is below the thresholds mentioned above within each country. The analysis derived from disposable income includes labor income, transfer income, and capital income with the taxes and social security contributions subtracted. The disposable income is adjusted for differences in family size. All

[2] Details on the background of LIS database can be found on http://www.lisdatacenter.org/

zero, negative or missing values of income were excluded from our samples[3]. To provide evidence that estimates are not sensitive to how the negative- or zero-income are treated, we replicate analyses by considering two alternative treatments of such income (a. exclude negative and zero income and simultaneously drop observations of those whose self-employed income is greater or equal to 50 percent of disposable income; b. recode negative income to zero). The results based on the last two approaches are very close to the ones separate from exclusion of negative and zero income (results are available upon request). Yet, we faced multiple measurement issues in assessing child poverty across countries with widely varying incomes and distributions within and between these nations. The role of household income is not limited to the overall poverty effect, but is also linked to fundamental issues of the measurement and adjustment of income and national price levels.

Deep Child Poverty

We start with the deep poverty concept, but choosing a certain percentage of median equivalized disposable income as the threshold has been an issue for many decades. In the LIS, traditional poverty rates are calculated at 40, 50 and 60 percent of the median income. The highest relative line at 60 percent is the Ireland, European Union and UK poverty standard. The half-median line is the usual measure for international bodies, such as UNICEF, OECD and LIS. The lower 40 percent of the median standard is closest to the poverty lines in other English-speaking nations, such as the United States. Deep poverty is measured at half the international relative measure, so 25 percent of the national median equivalised income is most comparable. Recent research (Fox, 2017; Short, 2013; Wimer & Smeeding, 2017) suggests that the US's new Supplemental Poverty Measure, which changes annually with per expenses spent by lower-income households, translates almost exactly to 40 percent of the median national adjusted income in the USA's most recent data in LIS Database as well as Canada's and Australia's LIS data. However, we understand that the creation of two relative poverty lines as benchmarks for a specific set of countries in the same study may result in interpretation complications. For the

[3] We realize inclusion of negative or zero income could result in overestimated poverty rates because nontrivial self-employed people may be miscategorized as poor, especially in less-developed countries. We report that the approximate percent of observations in each country is dropped due to such exclusions: 2.8% BR(06), 2.7% BR(09), 5% BR(11), 5% BR(13), 3.7% SA (08), 0.5% SA(10), 0.7% SA(15), 1.1% IN(04), 1% IN(11), 0.1% CN(02), 0.5% CN(13), 1.2% AU(03), 0.6% AU(08), 0.8% AU(10), 0.8% AU(14), 0.2% CA(04), 0.1% CA(07), 0.1% CA(10), 0.07% CA(13), 0.1% IE(04), 0.4% IE(07), 0.7% IE(10), 1.6% UK(04), 0.4% UK(07), 0.5% UK(10), 0.5% UK(13), 0.8% US(04), 1.2% US(07), 0.9% US(10), 0.8% US(13), 0.9% US(16)

purpose of comparability, thus, for each country we examined, the paper uses relative poverty line—25 percent of median equivalized income[4] based on the level and distribution of household income among the total population.

Extreme Child Poverty

Regarding the extreme (absolute) poverty, the consensus in most comparative studies of poverty is that local currency of each country should be converted into international US dollars using purchasing power parities (PPP) to allow direct comparison of absolute poverty rates – "extreme poverty" in our paper. However, if living standard in different years or locations is not taken into account, measuring extreme poverty over time across countries would be problematic. In terms of the incorporation of the updated poverty research, recent article by Pinkovskiy and Sala-i-Martin (2018) and conventional practice suggest that the most recent PPPs are usually the best ones, as they increase in coverage, sophistication and quality with each round. We apply the 2011 PPP values between countries using the LIS year closest to 2011. Of equal importance, any absolute or anchored poverty line should be adjusted over time for inflation within countries using the harmonized national CPI during periods when research is conducted (Smeeding, 2016).

The most prudent choice of a poverty threshold depends on the country, its context, and the time period under consideration. When it comes to adjusting poverty lines for family size, the equivalence scale matters a lot, as it measures the cost of providing an equal standard of living for households that differ by characteristics, such as ages of household members or the size of a household. The way that we consider the scales is presented in Equation 1:

$$S_i = (N_{i-a} + \gamma * N_{i-c})^{\theta} \tag{1}$$

Where S is the total household size, computed in equivalent adults for household i. $Ni\text{-}a$ indicates the total number of adults present in household i, and similarly, $Ni\text{-}c$ is the number of children below the age of 18 in household i. The parameter γ indexes the cost of a child's expenses relative to that of adults, while parameter θ represents the economies of scale regarding expenditures of household i. We test two different scales to determine our absolute measure. First, we assign both γ and θ values of 1, for which the number of equivalent adults is equal to the exact household size, leading to a per-capita-scale welfare measure. Alternatively, we set γ to

[4] Relative poverty is measured in the LIS by first adjusting disposable household income per equivalent adult using the same square root scale.

a value of 1 and let θ equal 0.5, which refers to "LIS square root scale," in order to adjust poverty thresholds according to a given household's living standard and size. The extreme child poverty rates are expected to be higher under the first premise, especially for results from the MICs where large household sizes have no economies of scale using the per capita per day method.

Harmonized CPI data from LIS serves as the method that we use to arrive at a historical estimate of inflation. The procedure that led to the new household income for the specific years examined is specified in Equation 2, where INC_t denotes income in international dollar for year *t*. Representing 2011 purchasing power parity exchange rates (US = 1), the 2011ppp is used to adjust each national currency into 2011 international USD.

$$INC_t = \frac{Income\ in\ local\ currency_t}{2011ppp} \tag{2}$$

To reduce our estimate bias resulting from inflation and to retain the same real poverty line, the two fixed thresholds (e.g., $2 and $6) that we used were adjusted backward to the specified years for each country using the national CPI. An example is presented in Equation 3, where CPI_t indicates Consumer Price Index (2011 = 100) for year *t*, and the adjusted poverty line Y_t is based on the CPI for year t.

$$Y_t = \frac{Fixed\ line}{CPI_t/100} \tag{3}$$

The extreme poverty lines in the present paper are set as $2 a day in MICs and $6 a day in HICs. Our choice of this "semi-absolute" measure was derived to meet the need to develop a more comparable "societal poverty line," as proposed by Atkinson (2016). Even though technically an international poverty line of $2 could represent a comparable way to track global poverty and evaluate progress on poverty reduction goals, this threshold is inadequate to meet the most basic needs for the developed world. It is estimated by the US Department of Agriculture that the minimum needed in the US to purchase food in 2011 was $5.04 per day (Hickel, 2015). Moreover, $6 a day is more or less close to the 20th percentile of the Supplemental Poverty Measure developed by the US Census Bureau, which might more accurately represent daily needs of the extreme poor in developed nations.

Although estimating consumption poverty is beyond our present paper's scope, we intend to employ a better absolute approach, which takes into account a slight "relative" element of

poverty, allowing for the variability of living standards and well-being across nations. This approach also closely aligns with the basic-need approach discussed in the latest report of better strategies to monitor global poverty, and it is necessary to note a "societal head count ratio approach" (Atkinson, 2016). In addition, when it comes to using the absolute measure of $1.90 a day per person to track global anti-poverty progress, some other proposals have been made that include a better set of thresholds meeting local needs (Allen, 2017; Ravallion & Chen, 2013). Thus, it is more appropriate to use a country's poverty line to better facilitate the policy discussion and to better target social programs that benefit the poorest children. In a further step of cross-national comparison between MICs and Anglo-Saxon nations, we compare the percentage of children living with less than $2 a day from each of the four MICs to the proportion of children living below $6 per day in five developed countries.

Income Decomposition

In addition to comparing the levels and trends of the poverty rates, we further decompose household income packages to assess the redistributive effects from different institutions. We start with sole market income to profile a big picture of market-driven monetary deep child poverty over time within each nation. We then take into account private transfer flow in influencing the overall ranking of deep child poverty. Following this, we factor in resources received from social insurance and universal programs in order to distinguish patterns of child outcomes in countries with or without universal programs. Lastly, we calculate deep child poverty rates when considering targeted transfers and tax payments (including refundable tax credits) in conjunction with previous income sources. Although the LIS database is the best cross-national archive that suits our needs for simultaneously and incrementally examining each of these income factors, some income definitions in several countries limit our analyses. For instance, there are some countries where universal benefits, targeted transfers, and tax payment could not be separately identified. The affected countries include Canada where universal program and assistance benefit data is unavailable in the years of 2004 and 2007; China, in which social insurance, universal programs and private transfers cannot be identified; India and Brazil where universal benefit data is unavailable. By proceeding with the best available data for the most recent year, after this decomposition exercise, we also calculate proportional changes to examine how the weights of each income component contributed to the national overall reduction in deep child poverty in the latest year.

4 Results

In Figure 1, we show that the relative/deep poverty rates among children across all countries of interest tend to remain flat across the whole period. Although some fluctuations are observable in Brazil and South Africa, whereas deep child poverty rates tended to be higher in India and China in the latest year relative to earlier points in time. This increase in relative poverty rates over the period examined may be due to growing inequality—real economic growth at the bottom of the distribution is lower for lower income families in these nations compared to the median income families (Alvaredo, Chancel, Piketty, Saez & Zucman, 2017). Focusing on the most recent year (of available data) for each nation, China can be distinguished by having the lowest relative proportion (5 percent) of children living in households with incomes lower than 25 percent of the median national disposable income; on China's heels are India (6.3 percent), Brazil (9.2 percent), and South Africa (11.6 percent).

< Figure 1 about here>

Turning to relative trends of the 5 developed nations, Ireland and UK appear to have relatively lower proportions of children living in households subsisting on less than 25 percent of median national equivalized income, while Australia's relative line fluctuates, before it reaches 2.4 percent in 2014. However, the US is the only developed nation we studied that struggles with relatively severe deep child poverty rates – approximately 5.6 percent nationwide[5], between 2004 and 2016 – using very comparable LIS data.

< Figure 2a about here>

The overall picture in extreme child poverty rates (Figures 2a and 2b) is very different when we deploy absolute measures. In addition to calculating the rates based on per-capita scale (2011PPP adjusted), we also estimate percentage of children living in absolute extreme poverty

[5] Given that the effect of self-employed income may have on our estimate of child poverty rates (i.e. negative income may be relevant to large assets, but it may not represent low living situation), we drop cases when their self-employed income is greater than or equal to 50 percent of disposable income, and re-estimate the deep child poverty rates in the US (available from the authors upon request). Result is consistent with the present version.

using LIS equivalence scale to reflect economies of household size. Figure 2a reports estimates of the proportions of children in 4 MICs, living on incomes of less than $2.00 per day, based on two different equivalence scales (LIS square root and per-capita scale). The solid line is based on the per-capita scale, while the dashed line displays the trend based on LIS square root.

It is interesting to note that two sets of lines within each country are virtually parallel, while tending to converge for the most recent years. All the lines trend downward in all countries, regardless of the different definitions of equivalence scales; this reflects widespread economic growth across all 4 of these nations. As we expected, given that the per-capita scale fails to account for the concept of resource-sharing within households, the solid lines based on per capita measures for each nation are always higher than those dashed lines representing extreme poverty rates that take economies of household size into account. Specifically, relative to the LIS square root, the per-capita scale measure reflects much higher rates of extreme poverty among children across these 4 countries, ranging from 2 to 5 times the poverty rates estimated using the LIS square root.

Results based on a per-capita scale indicate that the absolute national rate of extreme poverty among children in Brazil has decreased from 15 percent in 2006 to 8 percent in 2013. It is also promising to note that China showed a sharp reduction (approximately 30 percentage point) in the rate of extreme child poverty, from 34 percent in 2002 to just slightly above 3 percent in 2013. Similarly, South Africa and India show reductions of 11 percentage point and 18 percentage point, respectively, in their national rates of extreme child poverty within a seven-year period.

Based on analyses that are not shown here, trends in both deep and extreme poverty in our four middle-income countries are driven by the growth of market incomes. Despite rising inequality in overall incomes in each country, the growth dividend at the bottom of the distribution has reduced extreme child poverty in all of the nations. A new global middle class is emerging as poverty falls (Gertz & Kharas, 2018; World Bank, 2018b).

< Figure 2b about here>

Turning to absolute measures of the $6.00-a-day line across 5 high-income countries (Figure 2b), we observe a somewhat different conception of poverty reduction that we observed

in Figure 1 based on relative measures. Again, we display results based on both definitions of equivalence scales (either LIS square root or per-capita scale), as illustrated above for the MICs. Overall, starting in 2003, all 5 nations appear to achieve a modest reduction in their absolute rates of extreme child poverty after some fluctuations, while Canada and the US are notable for their unfavorably increasing proportion of children living on materially less than $6.00 per day in the most recent year we examined. Again, the US stands out due to having the highest levels of extreme poverty in the most recent year (about 4 to 6 times the rates in other high-income nations examined). The success of British anti-poverty efforts aimed at children is evident based on constant reductions of rates, regardless of choice of equivalence scale.

The idea of the income package (Rainwater & Smeeding, 2003) guides our analyses of why families may or may not be in deep poverty and the way the policy affects poverty rates. The income package includes incomes from three sources: those that are earned by the family per se (market incomes); those that come from other family members, including implicitly the economies of scale from larger household units, and private transfers across households, including remittances; and finally the effects of the state on income support, measuring net benefits (taxes paid minus benefits received).

For the rest of the analyses, we focus on data from the most recent year available for each country and describe our results. Figures 3a and 3b show the results of an analysis of deep child poverty rates[6], which are based on calculations using 25 percent of the median equivalised disposable income, to examine the marginal effects of each component of a given household's economic resources, incrementally and cumulatively, on changes in child poverty. We begin by estimating the market-income poverty rates, and then integrating private transfers into household income packages. We report two further sets of deep poverty rates based on (1) additional consideration of social insurance and universal programs as sources of income, and (2) the combination of means-tested benefits with net of tax and social security contributions.

<Figure 3a about here>

In Figure 3a, results suggest that among Australian children living in households that survive on only market income plus occupational pensions, around 15.4 percent could be

[6] We also calculate the extreme child poverty rates ($6 per day per person in developed nations and $2 per day per person in MICs) over time based on each component of a given household's economic resources (available from the authors upon request).

regarded as existing in conditions of deep poverty. Supplementing market income with private transfers, such as child support and other inter-household transfers, can yield only a slight reduction in the deep child poverty, lowering it to 14.9 percent. Similarly, it is possible to observe the very limited role that private transfers play in reducing deep child in 4 other Anglophone nations. When social insurance and universal programs, however, supplement the addition of private transfers, this combination can serve as a promising mode of reducing deep child poverty: by about 12 percentage points in Australia, 9 percentage points in Ireland, 5 percentage points in the UK, 4 percentage points in Canada and only 2 percentage points within the US. Yet, Canadian estimates for poverty reduction will soon be doubled as their new and generous child allowance benefit comes online in the 2016 LIS data (Corak, 2017). It is worth noting that means-tested transfers, along with net tax pay-outs (eg. in work benefits from the tax system), further reduce the deep poverty rate among children to less than 1 percent in the UK, to about 1.7 percent in Ireland, to 2.5 percent in Australia, and to 2.2 percent in Canada, while leaving slightly higher rates of 5.3 percent in the US.

< Figure 3b about here>

When we turn to 4 MICs[7] in Figure 3b, it is possible to observe a different account of poverty reduction story than the one we see in Anglophone nations. In South Africa, an overwhelming proportion (41 percent) of children would live in deep poverty if only market income were available. When households possess both market income and private transfers, the deep child poverty rate is reduced to 36 percent, which suggests that private transfers play a significant role in redeeming children from circumstances of deep poverty. Similarly, taking private transfers into account reduces deep child poverty rates in India by 4.5 percentage points. In Brazil and South Africa, the deep child poverty rates are reduced by another 2 to 6 percentage points when social insurance and universal benefits are added to a household income that was originally limited to market income and private transfers. More importantly, taking means-tested programs and tax payments into account yields a reduction of another 22 percentage points from

[7] Data from China regarding distinction of universal benefits, assistance benefits and private transfers is unavailable.

the deep child poverty rate in South Africa, while analogous programs in Brazil and India would reduce deep poverty rates by another 2 to 3 percentage points.

<Figure 4 about here>

We take a further step, to illustrate how the weights of different income components account for the total reduction in deep child poverty rates for each nation and shed light on which interventions may merit further attention. In Figure 4, we calculate the extent to which private transfers, social insurance, universal benefits, and net means-tested transfers contribute to the overall reduction in deep child poverty rates within each respective country. With the exception of Australia, where the reduction of deep child poverty is disproportionally due to social insurance and universal programs, across all of the other countries we have examined, net means-tested benefits play a substantial role in reducing deep child poverty; the most significant illustration of this (76 percent) can be observed in South Africa, but reduction rates range from 71 percent to 29 percent in the other nations. In addition, social insurance and universal programs contribute disproportionally to the reduction of Brazil's deep child poverty rate, relative to the contributions of such programs in the 4 Anglophone nations, Australia excepted.

5 Discussion and Conclusion

In recent years, many have questioned better ways to consistently measure child poverty across countries, especially among traditionally high-income nations and emerging upper-middle-income countries. As several larger economies have been reclassified as upper-middle-income nations, poverty reduction has become a main goal, which has led to a strong need to revisit issues regarding comparability in measurements of child poverty in countries with large differences in terms of their living standards and welfare regimes.

This paper contributes to the existing literature on poverty studies in two ways. First, instead of choosing one time point of a country for comparison, we estimated the trends of data of deep and extreme child poverty in two clusters of HICs and MICs to trace the poverty dynamics among this vulnerable population and to assess any progress that has been made over time under different social program provisions and welfare regimes. Second, we employ two equivalence scales to capture the absolute extreme poverty level and adjust the fixed poverty lines over time for inflation using the national CPI throughout the period examined to estimate

the different level poverty rates across these countries, through which we aim to offer new insights into the efforts of poverty measures via a more consistent channel.

Understandably, income is underreported in all the surveys we consider. Some detailed studies on the underreporting of income were carried out in the United States. Recent articles by Mittag (2019) and Meyer, Wu, Mooers and Medalia (2019) discuss these adjustments. One method of adjustment for underreporting comes from the Urban Institute's TRIM3 model (Wheaton, 2008), which adjusts for the underreporting of some kinds of benefits. A recent report by National Academies of Sciences, Engineering, and Medicine (2019) demonstrates that TRIM reduces baseline deep poverty (measured at half the SPM line) among children from 4.9 to 2.9 percent. Mittag (2019) finds that TRIM over-adjusts for underreporting, suggesting that factor alone should move the "correct" TRIM estimate above 3 percent. Meyer et al. (2019) use administrative data to adjust for benefit underreporting and mainly discuss extreme poverty (at $2 a day). They find that few persons live yearlong on incomes below $2 a day after all adjustments are made, many of them based on dubious principles (e.g. removing households who are not asset-poor but not adjusting for debts, and so on). They also adjust for self-employment, but we have already excluded the lowest-income self-employed people in our figures. These adjustments move many extremely poor people to the deeply poor category, and Meyer et al. (2019) find that those moved up by the receipt of in-kind benefits appear to be among the most materially deprived Americans.

We concede that our US estimates most likely overstate the proportion of deep poverty among US children. Of course, we might find the same tendencies in other nations, but clearly the US estimate is still an outlier: Approximately 5.3 percent are deeply poor in Figure 1 (panel A), which might fall to 3 percent after adjusting for benefit underreporting, compared to 2 percent or less for all other rich nations studied here for which no adjustments at all have been made. Moreover, as a complement to the traditional estimates from the World Bank on extreme poverty among whole population, our report on deep and extreme poverty among children still differs from the World Bank's in terms of the approach applied. With the assumption that economies of scale exist in household consumption and the concerns of self-employed households, our estimates might profile extreme poverty in developed nations more accurately. Similar to the patterns reported by Newhouse, Becerra and Evans (2017), we found that child poverty rates are higher than adult poverty ratios in all countries studied, regardless of which

equivalence scale is used. That being said, it is demonstrated that 1 in 30 children in the US experiences homelessness every year (Bassuk, DeCandia, Beach & Berman, 2014). A nontrivial proportion of homeless children has long been excluded from most surveys due to high mobility, which ought to draw our attention.

Our aim is to foster a better understanding of what severe child deprivation problems look like in a global context and what could be done in terms of safety nets or poverty-oriented economic growth to lift the poorest children out of poverty. We also tried to explore what other factors may have key influences on deep child poverty rates. In addition to the trends of deep and extreme poverty for each nation, we estimated the market income poverty levels; addressed the comparative roles of private transfers, social insurance, and universal benefits; and targeted cash as well as near-cash transfers and taxes on deep poverty.

The prevalence of large-scale social programs in Brazil, South Africa, and India demonstrates a response by the Global South to material deprivation. We observed a substantial reduction in child poverty in all 4 MICs during the examined period, with India experiencing the most dramatic drop. These trends were driven both by overall economic growth, which reduces market income poverty, and by income supports that raise family incomes and add in investments in health and education to better prepare children and each nation for further growth. In the latest years examined, interventions in public benefit systems became more prevalent in the MICs relative to their previous periods, with substantial reductions that resulted from conditional cash transfer (CCT) programs occurring in Brazil and South Africa.

Although less-developed nations tend to lean more on private transfers as they have relatively fewer comprehensive social protection systems, Brazil appeared to have smaller proportions of inter-household transfer flows; instead, universal programs gradually became a vital means of reducing deep child poverty, along with the gradually stronger social assistance[8]. India, however, stands out with its large inter-household transfer payments as its major means of

[8] Brazil has a long history of implementing cash transfer programs and is the pioneering country in Latin America in using them as an instrument of social programs. In addition to its universal coverage of healthcare, the conditional cash transfer program—Bolsa Família, the largest CCT program in the world—acts as a vital means of social assistance for needy families with children to reduce short-term poverty and improve long-term human capital, as it requires beneficiaries to ensure that their children fulfill educational goals and health requirements.

helping to lift impoverished children out of poverty. In addition, South African social assistance[9] appeared robust in terms of benefiting the deep poor.

The antipoverty effects of a household's income package in disadvantaged households with children varied across the 9 countries of interest in terms of their levels of reliance on public transfers or private support in fighting against deep poverty. Compared to other high-income counterpart nations, the US constantly experienced higher child poverty rates, regardless of the relative or absolute terms. Social insurance and universal programs in the US tend to be meager compared to those in other high-income countries, and the overall portion that the US contributes to reducing its deep child poverty is far lower than the portion Brazil contributes. While the overall reduction of deep poverty in the US is mostly due to means-tested programs, private transfer flows are also non-ignorable. A recent proposal for an unconditional monthly child allowance in the United Sates would eliminate deep child poverty at a very reasonable cost, were it implemented (Shaefer et al, 2018). It is also worth noting that, in the most recent year, Canada and Ireland increased their spending on social assistance programs, which substantially reduce deep or extreme poverty rates among children to tangibly lower levels, even when the effects are not yet shown. The primary results show that nations with universal benefits do better in lifting children out of deep or extreme poverty than those with targeted programs alone in rich nations (Brady & Burroway, 2012). In contrast, private transfers and remittances from relatives abroad as well as conditional cash transfers benefit the poorest children in the middle-income countries. We conclude that some type of a universal child benefit—complementing basic public health care and education—is needed to eradicate long-term child poverty in all types of nations.

[9] Despite the inadequate results concerning its long-term impact and concerns about sustainable funding, as a means-tested program in South Africa, the Child Support Grant plays a significant role in assisting low-income families and their children. In terms of targeting, this largest flagship social-assistance program has also done a good job: It covered only 10 percent of poor children when it was introduced in 1998, but it reached 85 percent in 2015 (11.7 million children; Oosthuizen, 2007).

References

Allen, R. C. (2017). Absolute poverty: when necessity displaces desire. *American Economic Review*, *107*(12), 3690-3721.

Almond, Douglas, Janet Currie, and Valentina Duque. 2018. "Childhood Circumstances and Adult Outcomes: Act II." *Journal of Economic Literature*, 56 (4): 1360-144.

Alston, P. (2017, December 15). *Statement on Visit to the USA, United Nations Special Rapporteur on Extreme Poverty and Human Rights*. Retrieved from http://www.ohchr.org/EN/NewsEvents/Pages/DisplayNews.aspx?NewsID=22533&LangID=E

Alvaredo, F., Chancel, L., Piketty, T., Saez, E., & Zucman, G. (2017). World inequality report 2018. The World Inequality Lab.

Atkinson, A. B. (2015). *Inequality: What can be done?* Harvard University Press.

Atkinson, A. B. (2016). *Monitoring global poverty: Report of the commission on global poverty*. The World Bank, Washington, DC.

Bassuk, E. L., DeCandia, C. J., Beach, C. A., & Berman, F. (2014). *America's youngest outcasts: A report card on child homelessness*. The National Center on Family Homelessness.

Brady, D., & Burroway, R. (2012). Targeting, universalism, and single-mother poverty: A multilevel analysis across 18 affluent democracies. *Demography*, *49*(2), 719-746.

Cai, Y., & Evans, M. (2018). Informal transfers in comparisons of income distributions: Lessons from rich and middle-income countries. *Journal of Income Distribution*, *26*(2), 1-20.

Corak, M. (2017). *Innovation in cash benefits to families with children: The Canada Child Benefit*. Retrieved from https://milescorak.files.wordpress.com/2017/07/text-corak-national-academysciences-engineering-medicine-child-poverty.pdf

Deaton, A. (2018). The U.S. Can No Longer Hide from Its Deep Poverty Problem. *The New York Times*. Retrieved from https://www.nytimes.com/2018/01/24/opinion/poverty-united-states.html

Edin, K. J., & Shaefer, H. L. (2015). *$2.00 a day: Living on almost nothing in America*. Houghton Mifflin Harcourt.

Engle, P. L., Fernald, L. C., Alderman, H., Behrman, J., O'Gara, C., Yousafzai, A., ... & Iltus, S. (2011). Strategies for reducing inequalities and improving developmental outcomes for young children in low-income and middle-income countries. *The Lancet*, 378(9799), 1339-1353.

Fernald, L. C., Gertler, P. J., & Neufeld, L. M. (2008). Role of cash in conditional cash transfer programmes for child health, growth, and development: an analysis of Mexico's Oportunidades. *The Lancet*, 371(9615), 828-837.

Fernald, L. C., Gertler, P. J., & Neufeld, L. M. (2009). 10-year effect of Oportunidades, Mexico's conditional cash transfer programme, on child growth, cognition, language, and behaviour: a longitudinal follow-up study. *The Lancet*, 374(9706), 1997-2005.

Fox, L. (2017). The Supplemental Poverty Measure: 2016. *Current Population Reports, P60–261 (RV). US Census Bureau*.

Gao, Q. (2017). *Welfare, Work, and Poverty: Social Assistance in China*. Oxford University Press.

Gao, Q. (2018). China's fight against poverty: Rallying all forces to eradicate poverty by 2020. In M. Stepan & J. Duckett (eds.), *Serve the People: Innovation and IT in China's Social Development Agenda*. Mercator Institute for China Studies (MERICS) Papers on China No. 6.

Gertz, G., & Kharas, H. (2018, February 13). *The road to ending poverty runs through 31 severely off track countries*. Retrieved from https://www.brookings.edu/blog/futuredevelopment/2018/02/13/the-road-to-ending-poverty-runs-through-31-severely-off-track-countries/

Gornick, J. C., & Jäntti, M. (2012). *Child poverty in high- and middle-income countries: selected findings from LIS* (Child Poverty Insights). New York, NY: UNICEF Policy and Strategy

Gornick, J. C., & Nell, E. (2017). *Children, Poverty, and Public Policy: A Cross-National Perspective* (No. 701). LIS Working Paper Series.

Gornick, J. C., & Smeeding, T. M. (2018). Redistributional Policy in Rich Countries: Institutions and Impacts in Nonelderly Households. *Annual Review of Sociology*, (0).

Hickel, K. (2015). *Could you live on $1.90 a day? That's the international poverty line*. Retrieved from https://www.theguardian.com/global-development-professionals-network/2015/nov/01/globalpoverty-is-worse-than-you-think-could-you-live-on-190-a-day

Heinrich, C. J. (2018). Presidential Address:"A Thousand Petty Fortresses": Administrative Burden in US Immigration Policies and Its Consequences. *Journal of Policy Analysis and Management*, *37*(2), 211-239.

Jencks, C. (2016). Why the Very Poor Have Become Poorer. *The New York Review of Books*. Retrieved from http://www.nybooks.com/articles/2016/06/09/why-the-very-poor-have-become-poorer/

Kanbur, R. (2012). Aid to the Poor in Middle Income Countries and the Future of the International Development Association. *Journal of International Commerce, Economics and Policy*, 3(02), 1250008.

Kanbur, R., & Sumner, A. (2012). Poor countries or poor people? Development assistance and the new geography of global poverty. *Journal of International Development*, 24(6), 686-695.

Luxembourg Income Study (LIS) Database. (2019). http://www.lisdatacenter.org (multiple countries; Accessed September 2017 to April 2018; Luxembourg: LIS.

Magnuson, K. A., & Votruba-Drzal, E. (2008). *Enduring influences of childhood poverty*. University of Wisconsin-Madison, Institute for Research on Poverty.

Meyer, B. D., Wu, D., Mooers, V. R., & Medalia, C. (2019). *The use and misuse of income data and extreme poverty in the United States* (No. w25907). National Bureau of Economic Research.

Mittag, N. (2019). Correcting for misreporting of government benefits. *American Economic Journal: Economic Policy*, 11(2), 142-64.

Moffitt, R., & Pauley, G. (2018). *Trends in the distribution of social safety net support after the Great Recession*. Stanford Center on Poverty and Inequality. Retrieved from http://www.econ2.jhu.edu/people/Moffitt/safety_net_distribution_trends.pdf

National Academies of Sciences, Engineering, and Medicine. (2019). *A Roadmap to Reducing Child Poverty*. Washington, DC: The National Academies Press. doi: https://doi.org/10.17226/25246

Newhouse, D., Becerra, P. S., & Evans, M. (2017). New global estimates of child poverty and their sensitivity to alternative equivalence scales. *Economics Letters*, 157, 125-128.

Oosthuizen, M. (2007). *Consumer Price inflation across the income distribution in South Africa*. Retrieved from

http://www.dpru.uct.ac.za/sites/default/files/image_tool/images/36/DPRU%20WP07-129.pdf

Pinkovskiy, M., & Sala-i-Martin, X. (2018). *Shining a Light on Purchasing Power Parities* (No. w24419). National Bureau of Economic Research.

Rainwater, L. & Smeeding, T. M. (2003). *Poor kids in a rich country: America's children in comparative perspective*. Russell Sage Foundation.

Ravallion, M., & Chen, S. (2013). A proposal for truly global poverty measures. *Global Policy*, 4(3), 258-265.

SAHRC & UNICEF. (2016). *Global goals for every child: Progress and disparities among children in South Africa*. Pretoria: UNICEF South Africa

Shaefer, H. L., Collyer, S., Duncan, G., Edin, K., Garfinkel, I., Harris, D.,…& Yoshikawa, H. (2018). A Universal Child Allowance: A Plan to Reduce Poverty and Income Instability among Children in the United States. *RSF: The Russell Sage Foundation Journal of the Social Sciences*, 4(2), 22-42.

Shei, A., Costa, F., Reis, M. G., & Ko, A. I. (2014). The impact of Brazil's Bolsa Família conditional cash transfer program on children's health care utilization and health outcomes. *BMC international health and human rights*, 14(1), 10.

Short, K. (2013). *The Research Supplemental Poverty Measure: 2012*. Current Population Reports. U.S. Census Bureau, Washington, D.C.

Smeeding, T. (2016). Poverty measurement. *The Oxford Handbook of the Social Science of Poverty*, 21. Oxford University Press.

Smeeding, T., & Thévenot, C. (2016). Addressing child poverty: how does the United States compare with other nations?. *Academic pediatrics*, 16(3), S67-S75.

Stevens, A., (2019). *Safety Net Enables Faster, More Permanent Exit from Deep Poverty*. Center For Poverty Research, UC Davis. Retrieved from https://poverty.ucdavis.edu/sites/main/files/file-attachments/stevens_deep_poverty_brief.pdf

Sulia, V., & Zikhali, P. (2018). *Overcoming Poverty and Inequality in South Africa : An Assessment of Drivers, Constraints and Opportunities* (English). Washington, D.C. : World Bank Group.

Trump, D. (2018, April 10). *Executive order reducing poverty in America by promoting opportunity and economic mobility*. The White House, Washington, DC. Retrieved from https://www.whitehouse.gov/presidential-actions/executive-order-reducing-poverty-america-promoting-opportunity-economic-mobility/

UNICEF and World Bank Group. (2016). *Ending Extreme Poverty: a Focus on Children*. Retrieved from https://www.unicef.org/publications/files/Ending_Extreme_Poverty_A_Focus_on_Children_Oct_2016.pdf

Waldfogel, J. (2010). *Britain's war on poverty*. Russell Sage Foundation.

Wheaton, L. (2008). *Underreporting of means-tested transfer programs in the CPS and SIPP*. Urban Institute.

Wimer, C., & Smeeding, T. M. (2017). USA Child Poverty: The Impact of the Great Recession. *Children of Austerity: Impact of the Great Recession on Child Poverty in Rich Countries*, 297. The United Nations Children's Fund and Oxford University Press.

World Bank. (2018a). *Historical classification by income*. Retrieved from https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and lending-groups

World Bank. (2018b). *Poverty and Shared Prosperity 2018: Piecing Together the Poverty Puzzle*. Washington, DC: World Bank.

Table 1. Historical classification by income among 4 middle-income countries

	2002	2004	2006	2008	2009	2010	2011	2012	2013	2015
Brazil	LM	LM	**UM**	→	→	→	→	→	→	→
China	LM	LM	LM	LM	LM	**UM**	→	→	→	→
India	L	L	L	**LM**	→	→	→	→	→	→
RSA	LM	**UM**	→	→	→	→	→	→	→	→

Note: LM = Lower middle income; UM = Upper middle income; L = Low income; RSA = the Republic of South Africa; Source: World Bank (2018a)

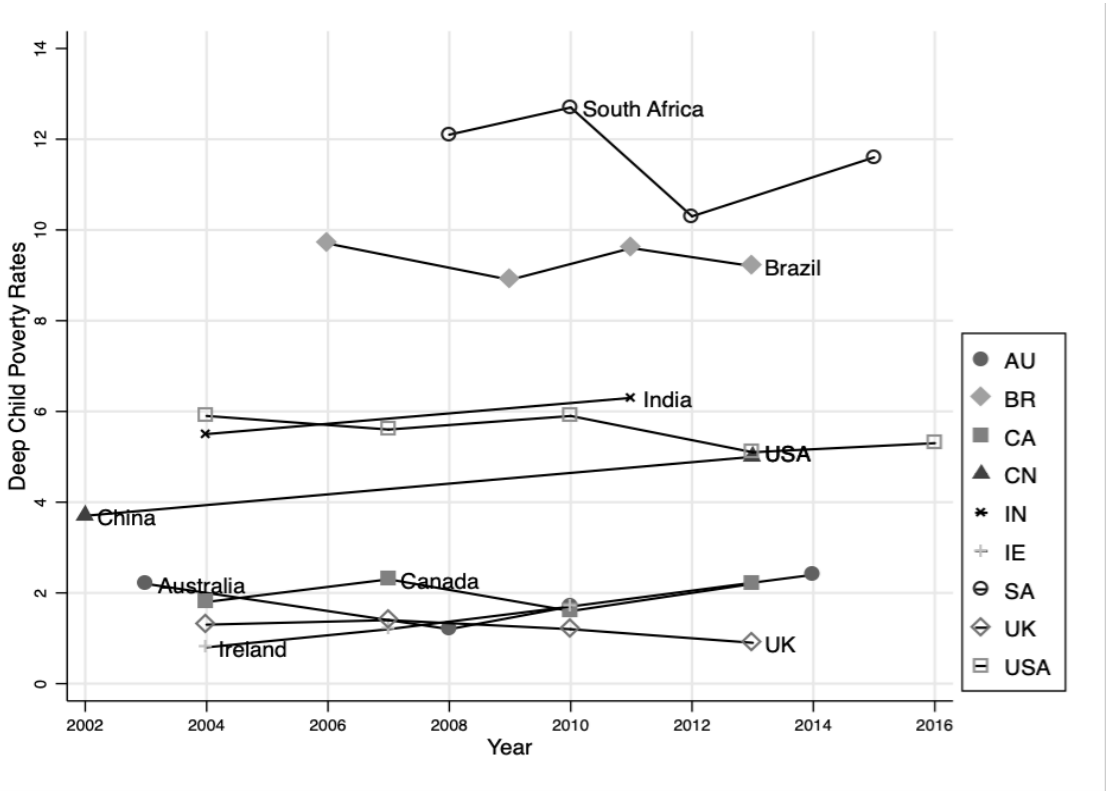

Figure 1. Deep child poverty across countries

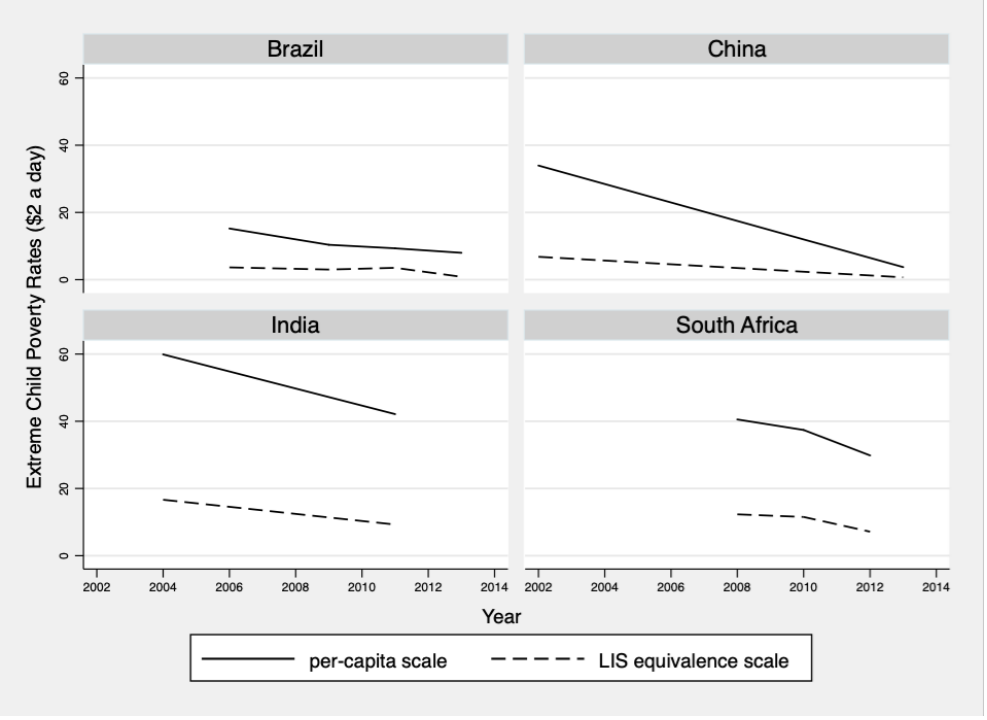

Figure 2a. Extreme child poverty across middle-income countries

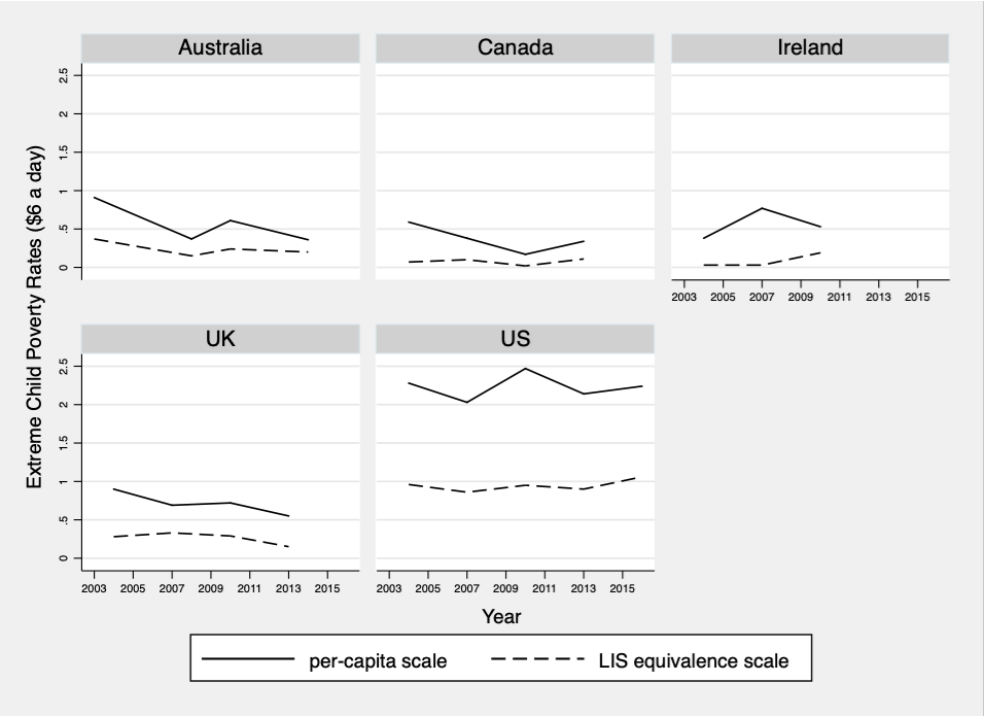

Figure 2b. Extreme child poverty across high-income countries

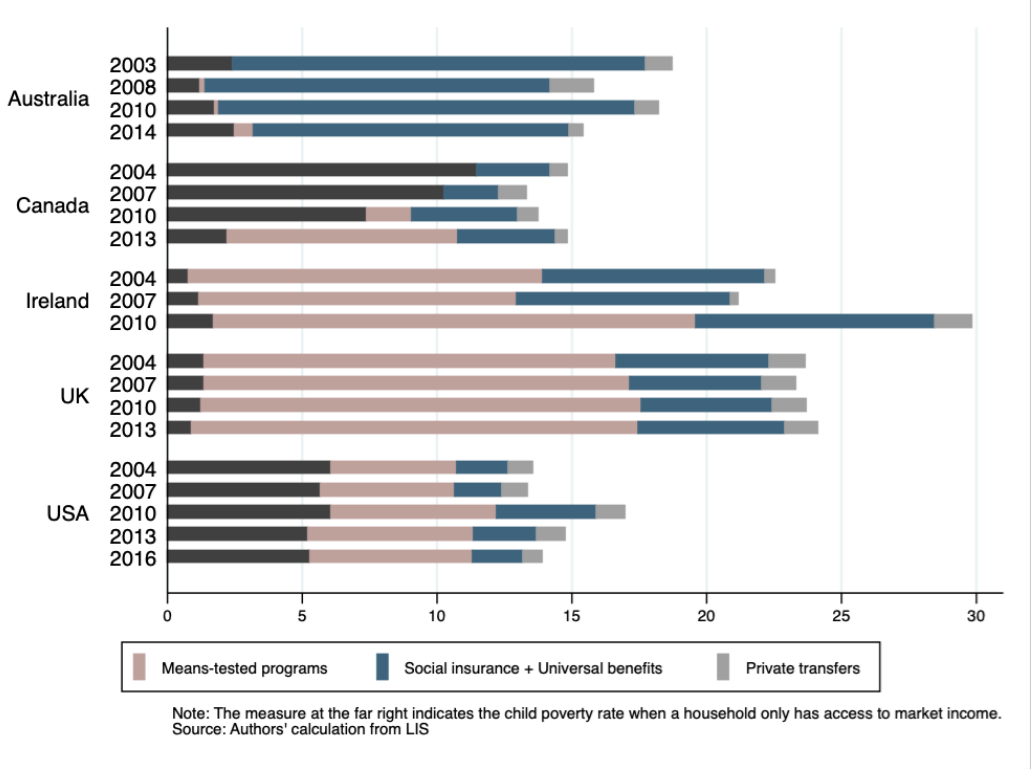

Figure 3a. Reduction in deep child poverty across Anglo-Saxon high-income countries

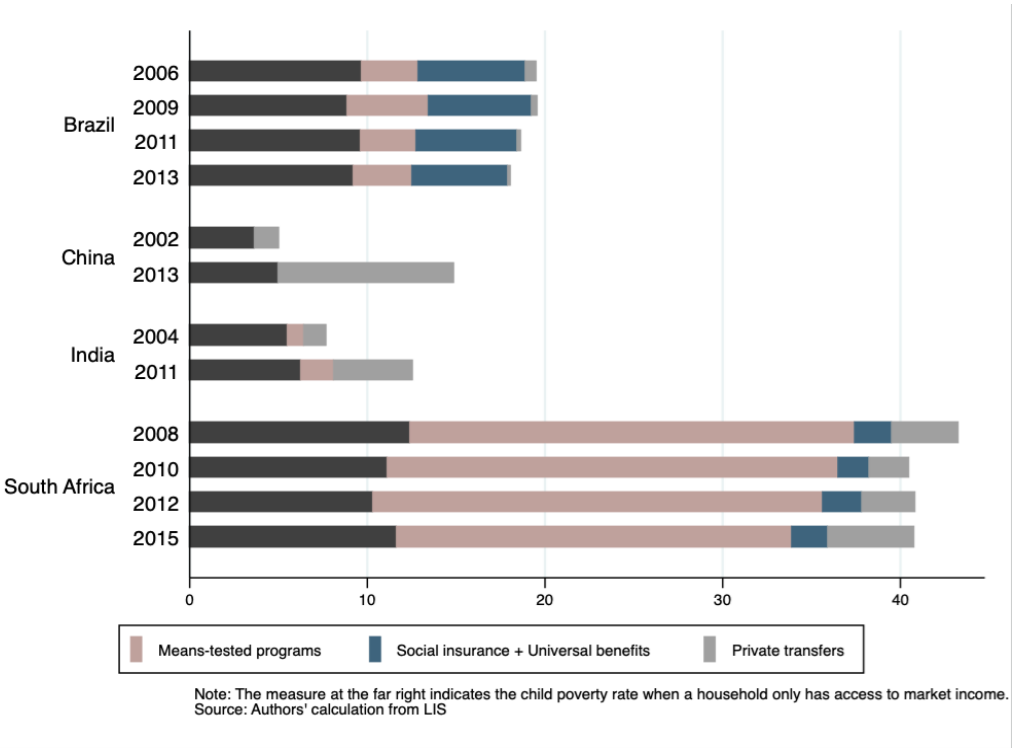

Figure 3b. Reduction in deep child poverty across upper middle-income countries

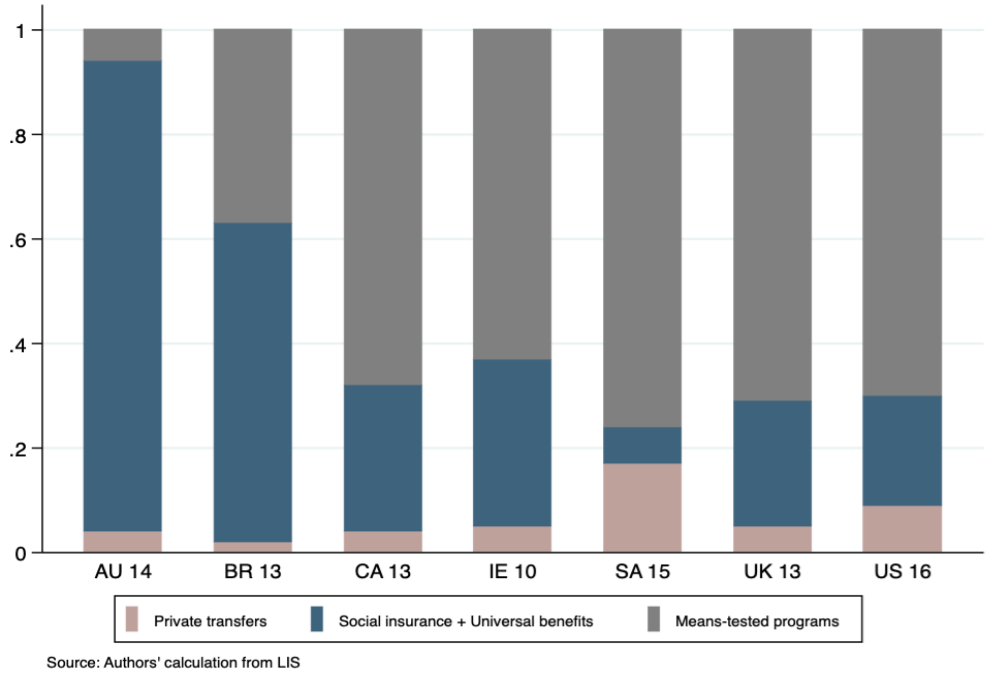

Figure 4. Percentage of deep child poverty reduction that each income component accounts for