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The Growth Elasticity of Poverty

Is Africa Any Different?

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Abstract

On current trends, the future of global poverty reduction will be determined by Sub-Saharan Africa. Yet even during Sub-Saharan Africa's period of high economic growth—roughly corresponding to the first decade and a half of the 2000s—the extent to which this growth translated into improved living standards for African households was hotly debated. This paper revisits the issue of Sub-Saharan Africa's relatively low growth elasticity of poverty using a sample of 575 successive and comparable growth spells between 1981 and 2021. The findings confirm that, even controlling for initial differences in poverty, income levels, and inequality, Sub-Saharan Africa consistently had a significantly lower growth elasticity of poverty relative to other regions over this period. The lower growth elasticity of poverty, which has remained unchanged over time, is due to a lower passthrough between growth in gross domestic product per capita (or growth in household final consumption expenditure as measured by national accounts) and growth in household consumption expenditures as measured from surveys. Given the low passthrough of economic growth to households, Africa thus needs higher rates of economic growth than its peer countries in other regions to achieve equal rates of poverty reduction. Given the challenge of achieving this in the current global economic environment, success in reducing global poverty will require a focused effort to strengthen the effect of aggregate economic growth on household welfare in Sub-Saharan Africa. The results suggest that this will require (i) improved provision of basic education services and basic infrastructure, (ii) faster structural transformation, and (iii) a decrease in the occurrence and persistence of violent conflicts.

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The Growth Elasticity of Poverty: Is Africa Any Different?

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1. Introduction

Since the early 1990s, the world has made tremendous progress in reducing extreme poverty. The global poverty rate, defined by the World Bank's extreme poverty line of US$2.15 a day (in 2017 Purchasing Power Parity), decreased from 38 percent in 1990 to less than 9 percent by 2019 (World Bank, 2022). This progress was mainly driven by East Asia and the Pacific (EAP), the region that accounted for the bulk of the poor in 1990, where poverty fell from 66 percent in 1990 to 1 percent by 2019. EAP's success implies that the future of global poverty reduction now lies squarely with Sub-Saharan Africa (SSA) and, to a lesser extent, South Asia. In 2019, 60 percent of the global poor lived in SSA, and this is projected to increase to 87 percent by 2030 (World Bank, 2022a). Progress in Sub-Saharan Africa will determine the success of global poverty reduction efforts in the coming decades.

Following two largely lost decades, growth in SSA accelerated to an average of 5 percent per year between 2000 and 2014, resulting in a reduction in the poverty rate from 56 percent in 2000 to 38 percent by 2014. However, growth faltered after 2014 and, given rapid population growth, per capita GDP in SSA was slightly lower in 2019 than in 2014.[2] Yet even during SSA's high growth period, there were concerns around the extent to which this growth benefited the poor. In reference to the period of high growth, Bhorat and Naidoo (2017) write that "*Africa's socioeconomic variables have not, however, matched this impressive economic performance*". Similarly, examining the growth, inequality, and poverty nexus in SSA, Thorbecke (2023, p ii81) writes that "*It is evident that economic growth in SSA in the past two decades has not been sufficiently inclusive*", while Fosu (2023, p ii167) states that "*Nonetheless, despite the apparent decline in poverty in SSA during the latter period* [SSA's growth resurgence period since the late-1990s], *the pace has been slow compared to other regions*". In short, there is a widespread belief that economic growth in SSA has been less poverty-reducing relative to other regions or, in other words, that the growth elasticity of poverty – the percentage change in poverty rates for a percent change in a per capita indicator of economic output – in SSA has been systematically lower.

This paper uses the most up-to-date database of comparable growth spells in developing countries between the early 1980s and 2021 to test this assertion and identify the main factors that make economic growth in SSA less poverty reducing. Compared to the early research on the growth elasticity of poverty (henceforth GEP),[3] we take advantage of important progress made in recent years in the quality and availability of household data. In particular, we benefit from larger sample size and cover a larger share of the developing world's population thanks to the strong increase in the number of household surveys since the early 2000s, including in previously un- or under-covered countries. We also benefit from the efforts to enhance intertemporal comparability of surveys within countries and include only comparable poverty estimates. While the main focus of the paper is on assessing regional differences in the GEP, the paper seeks to address three main questions: (i) does SSA, the continent with the highest poverty rate and also the slowest progress on poverty reduction, have a GEP that is significantly lower relative to the

[2] In this paper, we consider the region as a whole (Sub-Saharan Africa). The reader is advised that there is large heterogeneity and several non-resource rich countries have kept on growing fast post 2014.

[3] See, for instance, Ravallion and Chen (1997), Ravallion (2001), Bourguignon (2003), Ravallion (2004), Adams (2004), . Kakwani (1990; 1993) introduced the concept of the growth elasticity of poverty reduction but defined this as a partial elasticity, holding the distribution constant, resulting in large elasticities in absolute value.

rest of the world (that is, has growth systematically been less poverty-reducing in Sub-Saharan Africa relative to other regions), (ii) has the GEP changed over time (that is, has economic growth on average become more or less poverty-reducing over time), and (iii) are there variables that are amenable through policy that are robustly correlated with the extent to which economic growth translates into improved monetary living standards at the household level?

The analysis in this paper shows that, at the global level, the GEP is remarkably robust: Based on 575 comparable growth spells between 1981 and 2021, we find an average GEP of -2 with respect to survey means, the same as found by Ravallion (2004) in a far smaller sample. The GEP with respect to growth in GDP per capita is higher, at -2.8. In addition, the GEP has not changed through time, suggesting that the recent slowdown in global poverty reduction is mainly due to slowing growth. Our results confirm previous findings that the GEP is substantially lower in SSA, an effect that is mainly driven by a lower passthrough between growth in GDP per capita (or, alternatively, growth in household final consumption expenditure from national accounts) and growth in household consumption as measured from surveys. Finally, we find that the extent to which economic growth translates into improved monetary welfare at the household level is mediated by social stability/peace, the provision of basic public services (literacy and primary education), access to basic infrastructure (electricity, sanitation, and drinking water) and a country's economic structure (sectoral structure of employment and value added and rents from natural resources).

This paper proceeds as follows: Section 2 introduces the data used in the analysis and presents descriptive statistics on the GEP, disaggregated by region, time period, and other salient dimensions. Section 3 uses a regression framework to test, conditional on differences in initial conditions, whether there are regional disparities in the extent to which economic growth translates into poverty reduction and whether elasticities have changed over time. This section also tests whether the extent to which economic growth translates into improved household welfare is mediated by certain policy variables. The final section concludes.

2. Data description

We use data from the Poverty and Inequality Platform (World Bank, 2022b) which replaced PovcalNet, the World Bank's database for monitoring of global poverty (see World Bank, 2022c for a description of data sources and methods used).[4] The database contains income or consumption distributions from nationally representative household surveys typically carried out or supervised by national statistical offices or international agencies, used for national and international poverty monitoring. Following the traditional approach of the research on the GEP, we create a database of "spells" by combining each pair of consecutive surveys within every country. By construction, only countries with at least two comparable household surveys (and hence one spell) are included in the database of spells. This results in a dataset of 1,604 spells based on 1,870 nationally representative household surveys for 139 countries between 1969 and 2021. Countries presented in the database accounted for 95.1 percent of global population in 2019 (and 95.4 percent of population in the "developing world[5]").

The distribution of consecutive spells by regions is shown in Table 1. The majority of spells are from two regions with frequent (mostly annual) poverty surveys: Europe and Central Asia and Latin America and

[4] The Poverty and Inequality Platform replaced PovcalNet in March 2022.
[5] The world excluding high-income countries.

the Caribbean. Taken together, these regions account for 78 percent of observations and if not corrected, results will be dominated by these two regions. To correct the bias towards countries with many surveys, we construct weights equal to the inverse number of spells in each country.[6] By doing this, we made sure each country gets an equal weight of one in the analysis regardless of the number of spells available. This changes the regional distribution of spells by giving more weight to countries with fewer observations. The share of the Europe and Central Asia (ECA) and Latin America and the Caribbean (LAC) regions drops from 78 percent to 50 percent once weights are used, while the share of spells in Sub-Saharan Africa (SSA) increases from 5 to 24 percent. In terms of distribution through time, the lion's share of surveys started after 2010 (almost half of all weighted observations), followed by the period from 2000 to 2010 (37 percent) and the period before 2000 (14 percent). This is in line with the substantial investments in household survey data collection in low-income countries, and SSA in particular, since 2010.

For each spell, we calculate mean household consumption (or income) per capita (from surveys) as well as the US$2.15 a day poverty rate at both the start and the end of the spell. Survey means are expressed in 2017 Purchasing Power Parity (PPP) terms for reasons of comparability. Each of the country-spell years is merged with national accounts data (GDP and household final consumption expenditures, expressed in constant dollars and per capita terms) from the World Development Indicators (WDI).[7] Next, we calculate the "descriptive elasticity": The annualized change in poverty during a spell divided by the annualized change in survey mean consumption/income per capita during the spell (alternatively: GDP per capita). This results in an estimate of the GEP: the annualized change in the poverty rate for each percent change in per capita mean or GDP.

For the purposes of this paper, we are mainly interested in the elasticity of poverty to economic growth, as measured by growth in GDP per capita. It is this growth rate of GDP that is routinely reported by countries and international organizations, and which is often a target in economic development plans and policies. And it is also by this yardstick that the economic performance of countries is evaluated. We thus assess to what extent headline economic growth translates into improved household welfare, though we also report the elasticity with respect to survey means.[8] As one might argue that the concept of GDP includes many components that do not directly affect the lives of the poor, we also look at the elasticity between household final consumption expenditure as measured by national accounts (henceforth HFCE) and poverty.

Annex Table 1 presents the descriptive elasticities based on the full dataset of 1,604 spells. The summary statistics suggest that some data cleaning will be required to handle extreme values: The descriptive elasticities of poverty with respect to survey means range from -26,348 (indicating that a 1 percent increase in survey means is associated with a 26,348 percent reduction in poverty) to 2,593 (a 1 percent increase in survey means is associated with a 2,593 percent increase in poverty), while the elasticities with respect to GDP per capita range between -8,114 and 9,393. The outliers have a large influence on the average elasticity in our dataset of consecutive spells: The average GEP across all spells amounts to an implausibly large (in absolute value) -17.6 when growth is measured by survey means and -3.8 when

[6] If country X has five "spells" each of them will get weight of 1/5, while country Y with one spell will get the weight of one.

[7] Whenever a survey spans two years, we use weighted GDP across both years as our measure of GDP per capita.

[8] Given that poverty rates and household consumption are both measured from the same surveys, there is a clear and approximate identity-like relationship between both variables (see for instance Bergstrom, 2022). This is not the case for GDP, which is measured through national accounts.

growth is based on GDP per capita. Using the median elasticity across spells results in more reasonable values that are in line with previous estimates in the literature (a median GEP of -1.8 with respect to the survey mean and -2.1 with respect to per capita GDP). The outliers will however need to be dealt with in light of the forthcoming regression analysis.

Data intricacies and data comparability issues that give rise to implausible elasticity estimates have in previous research been dealt with by making defensible though largely arbitrary decisions. One approach has been to simply drop spells that are deemed incomparable. This approach has typically been adopted for the transition countries in Europe and Central Asia (ECA), where the exceptional increases in poverty during the post-Soviet Union economic meltdown result in implausibly large elasticities in absolute terms (see Ravallion, 2001). This is also borne out by our dataset, in which the average GEP across spells in ECA amounts to an implausibly large -42 (with respect to survey means) and a positive elasticity with respect to GDP growth (indicating that growth in GDP per capita has been associated with increases in poverty). Another approach has been to drop spells with positive elasticities from the analysis to avoid artificially reducing the average elasticity (Christiaensen and Hill, 2019). More recent research has also attempted to weaken the influence of outliers by trimming the top and bottom 5 percent of elasticity estimates. Having considered different options, we have decided to drop spells for which both the initial-year and end-year poverty rates (as measured by the US$2.15 2017 PPP a day line) are below 2 percent. We believe this is justified by the fact that (i) we are mostly interested in the relationship between growth and poverty reduction in countries that still have some extreme poverty to begin with and (ii) small absolute changes in poverty where baseline poverty rates are low tend to be large in relative terms, mechanically pushing up the absolute values of the estimated elasticities.[9]

The curated sample consists of 575 comparable spells between 1981 and 2021, based on 715 nationally representative household surveys for 89 countries representing over 92 percent of the population in the "developing world". The regional distribution of spells in the curated sample is shown in Panel B of Table 1. Compared to the full sample of 1,604 spells, the largest changes are observed in the ECA and SSA regions. As a result of their low poverty rates, the weighted share of ECA in the sample drops from 35 to 20 percent, while the share of SSA increases from 24 to 36 percent. There are no substantial changes in the weighted distribution of spells by time period (Table 2). About 20 percent of spells started before 2000, 40 percent started in the first decade of the 2000s and another 40 percent started after 2010. The distribution of spells by type of welfare aggregate is more skewed towards consumption in the curated sample, with 70 percent of spells using consumption as a measure of welfare and 30 percent using income. In this sample, the average descriptive GEP with respect to survey means and GDP per capita amount to -2.1 and -0.9, respectively, while the passthrough between growth in GDP per capita and growth in survey means is approximately unity (indicating that a 1 percent change in per capita GDP has on average been associated with a 1 percent change in household consumption as measured from surveys).

[9] For instance, a reduction in poverty from 1.7 percent to 1.1 percent, though small in absolute terms, comes down to a relative decrease of over 35 percent, which will result in a large elasticity (absolute value). Richer countries therefore tend to have larger elasticity estimates than poor countries. Klasen and Misselhorn (2007) propose the growth semi-elasticity of poverty as a preferred measured. The semi-elasticity measures the *percentage point* change in poverty for a percent change in mean consumption/income or GDP per capita. While the semi-elasticity is less sensitive to base effects, it tends to be lower for richer countries, as a, say, 5 percentage point reduction in poverty tends to be easier for a country with a baseline poverty rate of 70 percent than for a country with a baseline poverty rate of 8 percent.

3. Empirical analysis

3.1 Specification and main findings

To obtain a more robust estimate of the GEP and explore differences across regions and time periods, we estimate the following basic specification (Ravallion and Chen, 1997):

$$\Delta LogP_{it} = \alpha + \beta \Delta Log\mu_{it} + \Delta \epsilon_{it}$$

Where the rate of poverty reduction is regressed on the rate of growth (either in household consumption per capita, GDP per capita, or HFCE per capita). $\Delta LogP_{it}$ denotes the change in log poverty rates between time *t* and *t-1* in country *i* (expressed in annual terms) while $\Delta Log\mu_{it}$ is the change in real GDP per capita (or real per capita survey means) in the same country during the same period. We estimate this basic specification with and without country fixed effects. While this basic specification forms the core of the analysis, we will sequentially add several other variables to control for initial differences (in poverty rates, in inequality, etc.) and assess whether elasticities differ significantly across regions or time periods.

Results of the basic specification are reported in Columns (1) and (2) of Table 3 for elasticity with respect to survey means, Columns (3) and (4) for elasticity with respect to GDP per capita, and Columns (5) and (6) when growth is measured by HFCE per capita. Overall, using household consumption as the measure of growth, the GEP amounts to -1.8 and a slightly higher -2.0 when country effects are controlled for. In other words, on average within countries, a 1 percent increase in household per capita consumption (or income) as measured from surveys has been associated with a 2 percent decrease in the poverty rate. The GEP with respect to GDP per capita is higher, with a 1 percent increase in GDP per capita being associated with a 2.8 percent decrease in the poverty rate, on average within countries (Column (4) of Table 3). If economic growth is measured by HFCE per capita, the GEP is only slightly lower compared to using GDP per capita and ranges from -2.2 to -2.5 depending on whether or not country effects are controlled for (Columns 5 and 6 of Table 3).

The first salient observation from these results is just how robust the estimated elasticities are to different samples. Based on a sample of 120 spells, Ravallion (2004) writes "*The elasticity of the "$/day" poverty rate to growth in the survey mean is around –2,* […]", which is remarkably close to the GEP with respect to the survey mean we find in our sample of 575 spells.[10] The second salient observation is that in our sample, the GEP with respect to per capita GDP is larger than the GEP with respect to survey means, which is contrary to earlier research on smaller samples. Based on 126 spells, Adams (2004) finds a GEP of -2.3 with respect to GDP per capita, which is statistically indistinguishable from zero (compared to a significant -2.8 with respect to survey means). Ravallion (2001) also finds a lower elasticity when growth is measured by GDP per capita. We however find elasticities based on GDP per capita to be consistently larger than those based on survey means.[11]

Next, we add a number of variables that influence the relative pace of poverty reduction (our left-hand side variable). As expected, a higher poverty rate at the beginning of a spell is associated with a significantly slower relative reduction in poverty, as large relative reductions in poverty are more difficult to achieve when the base poverty rate is high (this relates to the earlier point that poor countries usually

[10] Ram (2011) finds a lower GEP but this is based on a higher poverty line. The GEP decreases when higher poverty lines are used (Ravallion and Chen, 1997).

[11] This result is independent of the sample used. Replicating the analysis on the full sample of 1,604 spells also results in a higher GEP with respect to GEP per capita than with respect to survey means.

have a lower GEP – see Column (1) of Table 4). However, initial poverty does not matter when growth is measured by GDP or HFCE per capita (see Column (1) of Table 5 and Column (1) of Table 6). Income or consumption inequality at the beginning of a spell is not significantly related to the relative pace of poverty reduction during the spell (see Column (1) of Table 4, Column (1) of Table 5, and Column (1) of Table 6). This echoes Ravallion (2012), who finds that controlling for the initial poverty rate, there is no evidence that higher inequality inhibits the pace of poverty reduction.

Among the key objectives of this paper is to test whether SSA has lower elasticities than other regions, whether elasticities have changed over time, and whether the effect of growth on poverty reduction is mediated by the level of inequality. To do so, we augment the earlier specification as

$$\Delta LogP_{it} = \alpha + \beta \Delta Log\mu_{it} + \gamma X_{i0} + \delta(\Delta Log\mu_{it} * X_{i0}) + \in_{it}$$

Where X_{i0} is the relevant characteristic whose mediating influence we wish to test (alternatively: region, time period, and initial inequality) and δ is the coefficient of the interaction between household consumption growth and the relevant characteristic. If δ is statistically significant, characteristic X_{i0} has an influence on the extent to which growth translates into poverty reduction.

Table 4 summarizes the results for survey means, while Table 5 and Table 6 summarize the results when growth is measured by GDP per capita or HFCE per capita, respectively. Column (2) in Table 4, Table 5 and Table 6 show the results of interacting growth ($\Delta Log\mu_{it}$) during a spell with a dummy variable for spells in SSA, with growth measured by survey means per capita (Table 4), GDP per capita (Table 5), and HFCE per capita (Table 6). Overall, controlling for initial poverty rates, initial welfare means and initial inequality, growth in SSA is associated with a significantly slower relative pace of poverty reduction compared to other regions, especially when growth is measured by GDP per capita (Table 5) and HFCE per capita (Table 6). The coefficient of the interaction term between GDP growth and the SSA dummy is positive and statistically significant at the five percent level (Column (2) in Table 5), while the interaction term between growth in HFCE per capita and SSA is significant at the one percent level (Column (2) in Table 6). The interaction between growth in survey means and the SSA dummy is also positive, but only marginally significant at the 10% level (Column (2) in Table 4). Overall, the estimated GEP for SSA amounts to -0.9 based on survey means, -1.0 based on GDP per capita, and -0.5 based on HFCE per capita, while the corresponding figures for other regions (non SSA) are -2.0, -2.5, and -2.4, respectively (these are marginal effects that control for differences in initial poverty and inequality). Regardless of the indicator of growth, growth between 1981 and 2021 was less poverty reducing in SSA relative to other developing countries. Column (3) in Tables 4-6 examine the effect of inequality in mediating the effect of growth on poverty reduction. Consistent with earlier studies, we find that higher levels of inequality greatly weaken the poverty-reducing effect of growth in household consumption. Column (3) of Table 4 shows that the interaction term between initial inequality and growth in survey means during a spell is large, positive, and highly significant, confirming the well-established finding that high levels of inequality reduce the transmission effect between growth in survey means and poverty reduction (Bourguignon, 2003; Bergstrom, 2022). To illustrate, the average GEP amounts to -2.3 for spells with an initial Gini coefficient lower than 40 but weakens to -1.4 when the initial Gini is 40 or higher. In other words, countries with a high level of inequality need to achieve faster growth to reduce poverty by the same factor, which may

be particularly challenging in light of inequality's impact on growth in the first place.[12] The same effect is however not found when growth is measured by GDP per capita (the interaction term between initial inequality and GDP growth is statistically insignificant in Column 3 of Table 5) or HFCE per capita (Column 3 of Table 6). In our sample, initial inequality does not affect the extent to which growth in GDP per capita or HFCE per capita translates into poverty reduction.[13]

Column (4) in Tables 4-6 tests whether the GEP has changed through time. For this, we group the growth spells in three categories, depending on the timing of the end year of the spell. The three categories we consider are spells that ended before 2000, spells that ended between 2000 and 2010, and spells that ended in 2011 or later. Results show that the extent to which growth translates into poverty reduction has not changed through time, with none of the interaction effects between time period and growth (in either survey means, GDP per capita, or HFCE per capita) being statistically discernible from zero (spells that ended before 2000 are the reference category). Estimated coefficients are negative, indicating that, if any, elasticities have actually strengthened over time (though not significantly so). Lack of significant changes in GEP over time is robust to different categorization of spells.[14] Therefore, the recent slowdown in poverty reduction is not due to a weakening transmission between growth and poverty reduction, but rather due to the slowdown in growth.

3.2 The passthrough between economic growth and household welfare

The finding from the previous section that the GEP with respect to GDP per capita is significantly lower in SSA relative to other regions while the GEP with respect to survey means is only marginally lower suggests that the passthrough between aggregate economic growth growth and household consumption growth is lower in Africa (that a given growth in per capita GDP results in less growth in survey mean consumption in SSA than elsewhere). This is confirmed by the results in Table 7, which show the results of regressing changes in survey mean consumption/income per capita during a spell on growth in GDP per capita, controlling for initial differences. On average, the passthrough between growth in GDP per capita and growth in survey means is statistically equivalent to unity, indicating that on average a 1 percent growth in GDP per capita is associated with a 1 percent growth in household welfare as measured from surveys. This result is robust to including country dummies (Column (2) of Table 7). The passthrough between economic growth and household consumption growth is however significantly lower in SSA (Column 4 of Table 7), suggesting that, relative to other regions, countries in SSA need higher economic growth rates to achieve a similar growth in household consumption expenditures as measured by surveys. This result holds when regressing household consumption expenditures from surveys on household final consumption expenditure as measured by national accounts (Table 8).[15] Strikingly, the elasticity between

[12] For literature on the impact of inequality on economic growth, see, for instance, Galor and Zeira, 1993, Bénabou, 1996; Aghion and Bolton, 1997. Dabla-Norris et al. (2015) for instance, find that rising inequality is associated with a medium-term decline in GDP growth.

[13] Inequality as measured from surveys tends however to be substantially underestimated (see, for instance, Chancel et al. (2023) for Africa).

[14] As a robustness check, we assigned spells to time periods depending on which time-period "dominates" the spell. For instance, a spell that started in 2006 and ended in 2011 would be assigned to the 2011-2021 time-period according to our first definition, but would be assigned to the 2000-2010 period according to the second definition. The definition of the spell does not alter any of the results: Estimated coefficients of the interaction terms between growth and time-period are always negative but never statistically significant.

[15] Household Final Consumption Expenditure measures the expenditure incurred by resident households on goods and services and is conceptually closest to household consumption expenditures as measured from surveys, though important differences remain – see Prydz et al., 2022.

household consumption from surveys and HFCE in SSA is equal to 0.18 and is not significantly different from zero, compared to 0.87 for the rest of the regions. In other words, in our sample of consecutive spells, private consumption as measured by national accounts has no predictive value for household consumption as measured from surveys in SSA.[16]

As mentioned earlier in this paper, the lower GEP in SSA should not be a surprise, given that elasticities tend to be lower in countries with high baseline poverty rates (and hence a given percentage point reduction in poverty will be smaller in relative terms). Although the regressions in Tables 4-6 control for both baseline poverty rates and baseline mean welfare, one could still argue that these controls are insufficient and that the result of lower elasticities in SSA is an artifact of the way the GEP is calculated.[17] While this argument can be valid, it cannot be extended to the regressions of survey means on GDP per capita or HFCE (presented in Table 7 and Table 8), as both the dependent (survey means) and key independent variable (GDP per capita or private consumption expenditure per capita) have a similar low base in SSA. As such, we consider the results in Table 7 and Table 8 as our strongest results, suggesting that economic growth (measured by either GDP per capita or HFCE per capita) has a lower passthrough to household consumption as measured from surveys in SSA relative to other regions. And given that poverty in most countries in SSA is measured based on household consumption expenditures from surveys, it suggests that GDP per capita growth must have a weaker effect on poverty reduction in SSA relative to other regions, independent of SSA's higher baseline poverty rates.

Two other issues need to be addressed before we can have reasonable confidence in the results presented so far. The first relates to surveys not adequately capturing rich households. One might argue that if richer households in Africa have higher consumption growth but are inadequately captured by household surveys, the lower passthrough between GDP growth and survey mean consumption growth in Africa may be due to sampling biases rather than a genuine lower effect of economic growth on household welfare.[18] Replicating the analysis by focusing on the passthrough between GDP growth and survey median consumption (which should be less affected by inadequate coverage of the rich) shows a similar pattern, with the interaction term between growth in GDP per capita and the SSA dummy being negative (*-0.56*) and statistically significant with a p. value of *0.011*. It is thus unlikely that under coverage of rich households can explain the lower passthrough between economic growth and household welfare in SSA. The second issue relates to the quality of national accounts. If lower income countries, many of which are in Africa, measure growth less well due to a variety of constraints, the associations between GDP growth and poverty reduction may be driven by quality issues. While it is not possible to completely dispel this concern, Angrist et al. (2021) do not find evidence that growth is on average measured less well in developing countries. We also tried to check the role of data quality by including the score on the World

[16] Replicating this analysis on all 1,604 consecutive spells gives a similar result, with the passthrough between household consumption from national accounts and household consumption from surveys being much lower in SSA.

[17] The concept of "semi-elasticities" has been proposed to address this, but arguably suffers from the reverse issue (a country with a baseline poverty rate of 9 percent cannot achieve a 10 percentage-point poverty reduction, while a poorer country with baseline poverty of 60 percent can).

[18] This would also mean that inequality in SSA is higher than what is measured by household surveys, which is what is argued by Chancel et al. (2023).

Banks Statistical Performance Indicators, a measure of statistical data quality, in all GEP regressions.[19] Adding this variable did not change any previous results in a significant way.

3.3 What mediates the effect of economic growth on household welfare?

As a final step in the analysis, we assess which factors mediate the effect of economic growth (measured by GDP per capita or HFCE per capita) on household welfare, as measured by household consumption or income per capita from surveys. In the absence of a strong theoretical framework on how the GEP is determined, we draw on the vast (and now largely defunct) cross-country growth literature and the more recent and country-specific microeconomic analysis on the determinants of household welfare to identify a list of variables that potentially mediate the relationship between economic growth and household welfare. The cross-country growth literature, particularly popular in the end of the 1980s and in the 1990s, used cross-country growth regressions to search for empirical linkages between long-run growth rates and a variety economic policy, institutional and political indicators.[20] While this literature has identified over 50 variables that are significantly correlated with growth in at least one specification, ranging from human capital and investment to levels of democracy and ethno-linguistic fractionalization, sensitivity analyses have shown that only a limited number of variables are robustly and systematically correlated with economic growth (Levine and Renelt, 1992): Human and physical capital (measured as a share of investment in GDP) and initial income levels. While the literature on the determinants of household welfare is less straightforward to summarize given substantial country heterogeneity and different data sources, robust correlates of household welfare include the level of education of household members, urban vs rural location (the location effect usually persists even after controlling for other socioeconomic factors), health status of household members and access to basic health services, presence of basic infrastructure (roads, electricity, schools, health centers, etc.) and exposure to conflicts and violence.[21] Indicators proxying good governance have also been shown to support income growth and poverty reduction (Doumbia, 2018). Based on the macro- and micro growth literature, we group the potential mediators of the passthrough between GDP and household consumption growth into four categories[22]:

i. **Human capital:** This category includes indicators of school enrollment and completion at different levels, literacy rates, child and maternal mortality rates, fertility, and life expectancy. We also include an indicator of intergenerational mobility (the probability that a child exceeds the education level of her/his parents for the cohort born in the 1980s). This last variable only varies by country (time series for this variable is available only for a limited set of countries[23]).
ii. **Economic and demographic structure**: Share of different sectors in GDP, employment share of different sectors, rents from natural resources as a share of GDP, inflation (average in the five years preceding the spell), gross fixed capital formation (with different lags), share of

[19] The Statistical Performance Indicators measure the capacity and maturity of national statistical systems by assessing the use of data, the quality of services, the coverage of topics, the sources of information, and the infrastructure and availability of resources (https://www.worldbank.org/en/programs/statistical-performance-indicators). We used a simple average for each country for the period 2014-2019.

[20] See, for instance, Barro (1991), Levine and Renelt (1992), and Durlauf (2009) for an overview.

[21] See, for instance, Glewwe (1991), Mensah et al. (2014), Christiaensen and Hill (2019), Corral et al. (2020) and the numerous World Bank country-specific poverty assessments.

[22] The list of potential mediators is also influenced by the pragmatic reason of data availability. To be included as a potential mediating variable, we require data for all countries and time periods included in our sample of spells.

[23] Data on intergenerational educational mobility are taken from Narayan et al. (2018).

domestic credit to the private sector, urban population share, population growth, and the share of working age in total population.

iii. **Access to basic infrastructure:** This includes the share of the population with access to electricity, the share of people using at least basic drinking water and sanitation services, and the share of people using the internet. We also include an indicator for rural connectivity (the Rural Access Index[24]).

iv. **Governance:** This includes type of regime (authoritarian, democratic or hybrid) and a set of World Bank Governance indicators such as voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law and control of corruption. This category also includes indicators of violent conflict from the Uppsala Conflict Data Program (UCDP)[25] (average number of total fatalities per 1,000 people, dummy for years when total fatalities exceeded 0.08 per 1,000 people and dummy for years when total fatalities exceeded 1,000 people[26]).

To assess whether the effect of economic growth on household welfare as measured by surveys is mediated by any of the specific variables mentioned above, we estimate the following specifications:

$$\Delta LogY_{it} = \alpha + \beta \Delta LogGDP\_Cap_{it} + \gamma X_{i0} + \delta(\Delta LogGDP\_Cap_{it} * X_{i0}) + \in_{it}$$

Where $LogY_{it}$ is the change in household consumption or income measured from surveys during time period t (a spell between two successive surveys), $\Delta LogGDP\_Cap_{it}$ is the change in GDP per capita (from national accounts) during the time period, and X_{i0} is the variable that potentially mediates the effect of GDP growth on household welfare growth. All regressions also include regional dummies (to control for time-invariant omitted variables at the regional level), the baseline survey mean (survey mean consumption or income at the start of the spell), and a dummy indicating the type of welfare aggregate variable used in the survey (consumption or income). This specification is estimated on two samples: (i) the core analysis sample of 575 successive spells, excluding spells where start- and end-year poverty is below 2 percent (as we are mainly interested in the passthrough between growth and household welfare in poorer countries) and (ii) the full sample of 1,604 successive spells, which is however dominated by upper middle income and high-income countries (these were excluded from the earlier analysis of the GEP due to their near-zero poverty rates, which biases the estimated elasticities). In addition, we also test whether these factors mediate the effect of economic growth on poverty reduction (where the left-hand side variable in equation is replaced by $\Delta LogP_{it}$). This analysis is based on the core sample of 575 spells. We also repeated this analysis using HFCE per capita instead of GDP per capita as a measure of economic growth.

Given that each potential mediating factor is introduced in isolation from others, we run separate regressions for each mediating factor. The specification is always the same, except for the mediating variable. Given that we consider 68 variables as potential mediators between economic growth and household welfare (see Annex Table 2 for the full list of variables we consider), and hence are likely to

[24] The Rural Access Index (RAI) measures the share of the rural population who live within two kilometers (typically equivalent to a walk of 20-25 minutes) of an all-season road as a proportion of the total rural population.

[25] Sundberg and Melander (2013).

[26] See Corral et al. (2020) on measuring conflicts and their impact on socio-economic wellbeing.

have several Type I errors, we control for the expected false discovery rate by calculating sharpened q-values (rather than ordinary p-values) proposed by Benjamini et al. (2006) and Anderson (2008).

At the outset, it is important to keep in mind that none of the associations, however economically and statistically significant they may be, have a causal interpretation. Rather, the aim is to identify policy variables that have been correlated with a higher or lower passthrough between aggregate economic growth on the one side and household welfare and poverty on the other. In addition, the reader should keep in mind that household welfare growth and poverty reduction typically require a combination of policies and investments, and that acting on any one of the mediating variables may have only limited effects if progress is not made on others.

Table 9 summarizes the results from the analysis. This table only includes variables that were statistically significant in at least one of the three regressions. Looking at the "current values", which indicate the interaction of the mediating variable measured at the first year of the spell with growth in GDP per capita during the spell, we find that basic education, access to basic infrastructure, and the share of natural resources in GDP are significantly associated with the extent to which growth translates into household welfare. All associations have the expected sign: A higher net primary school enrollment rate and a higher youth literacy rate are associated with a higher passthrough between economic growth and household welfare, at least in some of the regressions. The finding that net primary school enrollment amplifies the effect of growth on poverty reduction but is not significantly related to the elasticity between economic growth and mean consumption suggests that primary education is especially important for the extent to which the poor benefit from aggregate growth. Among the infrastructure variables, more widespread access to electricity is associated with a stronger elasticity between economic growth and household consumption and poverty, as are the share of the population with access to at least basic drinking water and basic sanitation, which can perhaps be interpreted as indicating a lower burden of disease among a country's population. The variables on economic structure find, as expected, that being commodity-dependent, measured by a higher share of natural resources in GDP, is associated with a lower passthrough between economic growth and household welfare levels.[27] Somewhat surprisingly, oil, gas, or coal rents are not robustly associated with the elasticity between economic growth and household welfare, while forest rents are. While this result is somewhat puzzling, one hypothesis relates to increased household vulnerability to climate shocks in areas with high deforestation. High forest rents are indicative of overharvesting of forests, which amplifies the effects of increasingly frequent climate shocks and hence hamper poverty reduction. Violent conflict is associated with a lower passthrough between GDP growth and household welfare, but only in one of the specifications.

For certain mediating variables, their effect can only be expected to materialize in the longer-term (for instance, one would not expect the level of gross domestic capital formation to influence the passthrough between growth and poverty reduction in the short term). To allow for this, we also interacted growth during a spell with the level of the mediating variable 5, 10, 15 or even 20 years prior to the start of the spell. Using lagged levels of mediating variables points towards the role of economic and employment structure in influencing the elasticity between economic growth and household-level welfare outcomes. A higher share of value added in agriculture five years prior to the start of a spell is associated with a lower passthrough between growth and household welfare, while a higher employment share in services has

[27] Focusing on African countries, Berardi and Marzo (2015) also find that resource- or commodity-driven growth only has a weak effect on poverty.

the opposite effect (Table 9). Using 10-year lags gives qualitatively similar results, with higher shares of economic activity and employment in services and industry strengthening the elasticity while a higher weight of agriculture lowers it. Next to boosting economic growth in itself, the process of structural transformation also seems to boost the extent to which growth benefits households. None of the other variables listed in Annex Table 2 were statistically significant in any of the regressions after adjusting for multiple hypotheses testing.[28]

Repeating the analysis using HFCE instead of GDP confirms significance of the mediating factors found earlier (for GDP), and identifies several others (Table 10). Most notably, higher fertility rates, population growth and higher age dependency ratio are associated with a lower passthrough between economic growth and household welfare levels. This is a relevant finding since population growth and fertility rates remain the highest in SSA. Second, more education variables turned out to be significant in HFCE regressions than in regressions using GDP as a measure of economic growth, highlighting the importance of human capital in spreading the benefits of growth. Secondary education in particular amplifies the extent to which growth in HFCE translated into poverty reduction. Higher public spending on secondary education is also associated with a larger passthrough between HFCE and survey mean consumption. Lower rural accessibility and higher incidence of violent conflicts are associated with a significantly lower passthrough between economic growth and wellbeing. While the analysis in this section is correlational and exploratory, it suggests that the effective provision of basic public services, in particular basic education, and infrastructure and the process of structural transformation strengthen the effect of economic growth on household welfare and poverty reduction. The provision of basic education services increases the passthrough between growth and household monetary welfare, as do basic infrastructure assets such as access to electricity and safe drinking water and basic sanitation. High fertility and rapid population growth constrain the growth-poverty relationship through increasing the age dependency ratio. The process of structural transformation whereby labor shifts from agriculture to services and industry, and from rural to urban areas, is associated with a greater welfare-enhancing effect of aggregate economic growth. Finally, the extent to which economic growth benefits households is weakened by exposure to violence and conflict. The findings of our analysis complement those of Thorbecke and Ouyang (2022), who argued for "pro-growth poverty reduction strategies", as direct interventions in poverty reduction were found to result in faster growth, which in its turn results in faster poverty reduction. Our results suggest another channel, that direct interventions that are good for the poor (basic education and literacy, access to electricity, access to drinking water and sanitation, etc.) also amplify the passthrough between aggregate economic growth and household welfare, sharing the benefits of economic growth more widely.

4. Conclusions

In this paper we revisit the growth elasticity of poverty based on an updated database of successive and comparable growth spells covering the period 1981-2021. We focus on three main questions: (i) does SSA, the continent with the highest poverty rate and also the slowest progress on poverty reduction, have a GEP that is significantly lower relative to the rest of the world, (ii) has the GEP changed over time (that is, has economic growth on average become more or less poverty-reducing over time), and (iii) are there

[28] Certain human capital variables like mortality rates and intergenerational mobility had significant p-values, but these disappeared once using Anderson's q values.

variables that are amenable through policy that are robustly correlated with the extent to which economic growth translates into improved monetary living standards at the household level?

We find that the extent to which GDP per capita growth translates into poverty reduction is significantly lower in SSA than in the rest of the world. While this is expected given the higher baseline poverty rates in SSA (and hence mechanically lower elasticities given that large relative reductions in poverty are more difficult to achieve if the base poverty rate is high), the effect persists when controlling for initial levels of poverty, income, and inequality. The lower growth elasticity of poverty in SSA is mainly driven by a low passthrough between GDP per capita growth (or growth in HFCE) and household consumption growth measured by surveys. The analysis of the passthrough between GDP per capita (and HFCE) and household consumption does not suffer from the same base effects as the poverty analysis, which is why we consider those as our strongest results. Splitting our sample into three time periods, we find that elasticities have not significantly changed over time. The temporal variation in poverty reduction is thus mainly due to variations in growth rather than differences in the extent to which growth translates into poverty reduction.

In trying to shed light on the lower elasticity in SSA, we examine which factors are robustly associated with the extent to which aggregate economic growth translates into household welfare. With little theory to guide us, we drew on the cross-country growth literature and the research on the determinants of household welfare to identify three groups of variables that potentially influence the passthrough between economic growth and household welfare: Variables proxying investments in human capital, variables proxying investments in basic infrastructure, and variables describing a country's economic and demographic structure. In the human capital category, better basic education (primary education and literacy) is significantly associated with a higher passthrough between growth and household welfare. In the basic infrastructure category, higher levels of electrification and access to clean drinking water and basic sanitation amplify the effect of economic growth on household consumption. Finally, a higher share of employment and value added in agriculture and a higher share of natural resources (mineral rents and forest rents) in GDP consistently inhibit the poverty-reducing effect of GDP growth, while more employment in services and industry increases the elasticity, on average. Exposure to violent conflicts was found to be a separate significant factor limiting passthrough between economic growth and wellbeing.

Though only associations, the findings point towards the importance of basic service delivery and the provision of basic infrastructure in spreading more widely the benefits of economic growth. Getting the basics in place appears crucial. In human capital, this includes primary education and, as a result, literacy. In basic infrastructure, electricity, basic sanitation, and drinking water consistently amplify the effect of economic growth on poverty and household monetary living standards. In addition, the process of structural transformation during which labor shifts from agriculture to services and industry and from rural to urban also appears to boost the poverty-reducing effect of growth (next to driving growth itself). In general, variables that amplify the effect of economic growth (such as primary school enrollment, literacy rates, access to electricity and drinking water, etc.) are scarcer in African countries, while variables that inhibit the poverty-reducing effect of growth (employment and value-added in agriculture, natural resource dependency etc.) are more abundant (Annex Table 3). Deeper analysis would however be necessary to more comprehensively assess the reasons behind Africa's lower passthrough between economic growth and household welfare.

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Tables

Table 1. Distribution of spells by regions

	Panel A: All spells			Panel B: Spells with poverty rates higher than 2 percent		
	Number of spells	Share of spells, unweighted	Share of spells, weighted	Number of spells	Share of spells, unweighted	Share of spells, weighted
East Asia and Pacific	126	8	12	69	12	10
Europe and Central Asia	884	55	35	109	19	20
Latin America and Caribbean	362	23	15	278	48	22
Middle East and North Africa	72	4	9	11	2	6
North America	46	3	1	0	0	0
South Asia	31	2	4	28	5	6
Sub-Saharan Africa	83	5	24	80	14	36
Total	1,604	100	100	575	100	100

Notes: Panel A shows the regional distribution of all 1,604 consecutive spells, while Panel B focuses on the 575 spells where both start and end-year poverty rates are above two percent.

Table 2. Distribution of spells withpoverty rates higher than 2 percent across region and time period

	Number of spells			Share of spells, unweighted			Share of spells, weighted		
	before 2000	2000-2010	2011 and above	before 2000	2000-2010	2011 and above	before 2000	2000-2010	2011 and above
East Asia and Pacific	26	23	20	38	33	29	48	31	21
Europe and Central Asia	7	59	43	6	54	39	8	57	35
Latin America and Caribbean	82	117	79	29	42	28	38	40	22
Middle East and North Africa	7	3	1	64	27	9	53	27	20
South Asia	6	11	11	21	39	39	15	53	32
Sub-Saharan Africa	12	28	40	15	35	50	7	31	62
Total		575		24	42	34	21	39	39

Notes: Table shows the number of spells by region and time period. Only 575 spells with both start- and end-year poverty rates of at least 2 percent are included.

Table 3: The growth elasticity of poverty

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
gr_change	-1.826***	-1.974***	-2.307***	-2.762***	-2.204***	-2.491***
	(0.164)	(0.199)	(0.326)	(0.501)	(0.345)	(0.516)
Constant	-0.0152**	-0.109	0.0132	-0.0883	-0.00144	-0.125*
	(0.00731)	(0.0841)	(0.00976)	(0.0825)	(0.0122)	(0.0759)
country fixed effect	No	Yes	No	Yes	No	Yes
Observations	575	575	575	575	505	505
R-squared	0.432	0.590	0.174	0.390	0.208	0.386

Notes: Table shows results of a regression of the annualized log change in poverty headcount on the annualized log change in survey means (Columns (1) and (2)) or GDP per capita (Columns (3) and (4) or HFCE per capita (Columns (5) and (6). Sample consists of all consecutive spells between 1981 and 2021, dropping spells with baseline and endline poverty rates lower than 2 percent. Robust standard errors in brackets. ***: Statistically significant at 1%; **: Statistically significant at 5%; *: Statistically significant at 10%.

Table 4: The growth elasticity of poverty based on household consumption as measured from surveys

	(1)	(2)	(3)	(4)
VARIABLES				
gr_change	-1.847***	-1.966***	-4.030***	-1.664***
	(0.160)	(0.159)	(0.607)	(0.289)
initial poverty rate	0.171***	0.1000**	0.181***	0.183***
	(0.0373)	(0.0418)	(0.0381)	(0.0374)
initial inequality	-0.148	-0.181*	-0.285***	-0.170*
	(0.0909)	(0.101)	(0.0937)	(0.0936)
intial survey mean	0.00791**	0.00634*	0.009***	0.00858***
	(0.00327)	(0.00331)	(0.003)	(0.00324)
interval	0.00902***	0.00612**	0.009***	0.00842***
	(0.00325)	(0.00305)	(0.003)	(0.00310)
Baseline: other regions				
SSA		0.0182		
		(0.0234)		
gr_change x				
SSA		1.072*		
		(0.571)		
initial headcount gini			5.111***	
			(1.239)	
Baseline: <2000				
2000-2010				-0.0402**
				(0.0186)
2011 and above				-0.0270*
				(0.0159)
gr_change x				
2000-2010				-0.176
				(0.369)
2011 and above				-0.298
				(0.386)
Baseline: Consumption				
Income	0.0170	0.0265	0.0163	0.00977
	(0.0292)	(0.0301)	(0.0279)	(0.0287)
Constant	-0.0914***	-0.0515	-0.0383	-0.0585*
	(0.0350)	(0.0387)	(0.0345)	(0.0349)
country fixed effect	No	No	No	No
Observations	574	574	574	574
R-squared	0.466	0.481	0.489	0.473

Notes: Table shows results of a regression of the annualized log change in poverty headcount on the annualized log change in survey means. Sample consists of all consecutive spells between 1981 and 2021, dropping spells with baseline and endline poverty rates lower than 2 percent. Robust standard errors in brackets. ***: Statistically significant at 1%; **: Statistically significant at 5%; *: Statistically significant at 10%.

Table 5: The growth elasticity of poverty based on GDP per capita

VARIABLES	(1)	(2)	(3)	(4)
gr_change	-2.263***	-2.464***	-3.148**	-1.264
	(0.307)	(0.352)	(1.437)	(0.784)
initial poverty rate	0.0313	-0.00292	0.0313	0.0426
	(0.0365)	(0.0405)	(0.0366)	(0.0345)
initial inequality	-0.0736	-0.123	-0.130	-0.0988
	(0.0968)	(0.105)	(0.120)	(0.101)
intial GDP per capita	4.04e-06	3.62e-06	4.63e-06	5.31e-06
	(4.64e-06)	(4.67e-06)	(4.68e-06)	(4.77e-06)
Interval	0.00523	0.00302	0.00496	0.00412
	(0.00366)	(0.00355)	(0.0037)	(0.00379)
Baseline: other regions				
SSA		-0.00856		
		(0.0297)		
gr_change x				
SSA		1.487**		
		(0.605)		
initial headcount gini			2.133	
			(3.107)	
Baseline: <2000				
2001-2009				-0.0335
				(0.0286)
2010 and above				-0.0359
				(0.0271)
gr_change x				
2001-2009				-1.273
				(0.949)
2010 and above				-0.880
				(0.882)
Baseline: Consumption				
Income	0.00572	0.00762	0.0048	-0.00448
	(0.0345)	(0.0374)	(0.0346)	(0.0354)
Constant	0.00317	0.0395	0.0281	0.0405
	(0.0461)	(0.0480)	(0.0591)	(0.0546)
country fixed effect	No	No	No	No
Observations	574	574	574	574
R-squared	0.178	0.186	0.178	0.203

Notes: Table shows results of a regression of the annualized log change in poverty headcount on the annualized log change in GDP per capita. Sample consists of all consecutive spells between 1981 and 2021, dropping spells with baseline and endline poverty rates lower than 2 percent. Robust standard errors in brackets. ***: Statistically significant at 1%; **: Statistically significant at 5%; *: Statistically significant at 10%.

Table 6: The growth elasticity of poverty based on HFCE per capita

VARIABLES	(1)	(2)	(3)	(4)
gr_change	-2.139***	-2.379***	-3.724**	-1.771**
	(0.364)	(0.455)	(1.482)	(0.833)
initial poverty rate	0.0165	-0.0242	0.0155	0.0439
	(0.0482)	(0.0446)	(0.0483)	(0.0408)
initial inequality	0.0779	-0.0480	-0.0436	0.00392
	(0.109)	(0.125)	(0.134)	(0.110)
intial HFCE	1.49e-05	1.20e-05	1.53e-05	1.88e-05
	(1.12e-05)	(1.14e-05)	(1.12e-05)	(1.15e-05)
interval	0.00544	0.00221	0.005	0.00511
	(0.005)	(0.005)	(0.005)	(0.0045)
Baseline: other regions				
SSA		0.00223		
		(0.0270)		
gr_change x				
SSA		1.846***		
		(0.690)		
initial headcount gini			3.878	
			(3.061)	
Baseline: <2000				
2000-2010				-0.0427
				(0.0434)
2011 and above				-0.0604
				(0.0410)
gr_change x				
2000-2010				-0.587
				(0.918)
2011 and above				0.0531
				(0.891)
Baseline: Consumption				
Income	-0.0169	-0.00369	-0.0171	-0.0257
	(0.0411)	(0.0467)	(0.0410)	(0.0395)
Constant	-0.0827*	-0.0105	-0.0294	-0.0194
	(0.0474)	(0.0616)	(0.0683)	(0.0692)
country fixed effect	No	No	No	No
Observations	505	505	505	505
R-squared	0.219	0.233	0.223	0.237

Notes: Table shows results of a regression of the annualized log change in poverty headcount on the annualized log change in HFCE per capita. Sample consists of all consecutive spells between 1981 and 2021, dropping spells with baseline and endline poverty rates lower than 2 percent. Robust standard errors in brackets. ***: Statistically significant at 1%; **: Statistically significant at 5%; *: Statistically significant at 10%.

Table 7: Passthrough between GDP growth and household welfare growth from surveys

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
gdp_change	0.897***	1.103***	0.911***	0.998***	0.459	0.550**
	(0.0999)	(0.149)	(0.107)	(0.119)	(0.549)	(0.258)
initial inequality			0.0131	0.0127	-0.0156	0.0247
			(0.0454)	(0.0487)	(0.0594)	(0.0453)
intial survey mean			-0.003**	-0.003**	-0.003**	-0.003**
			(0.00125)	(0.00139)	(0.00126)	(0.00123)
interval			0.001	0.002	0.001	0.002
			(0.002)	(0.001)	(0.002)	(0.002)
Baseline: other regions						
SSA				0.0155		
				(0.0113)		
gdp_change x						
SSA				-0.499**		
				(0.217)		
Initial inequality					1.091	
					(1.293)	
Baseline: <2000						
2000-2010						0.00769
						(0.0125)
2011 and above						0.0183
						(0.0119)
gdp_change x						
2000-2010						0.543*
						(0.303)
2011 and above						0.167
						(0.293)
Baseline: Consumption						
Income			0.0319**	0.0351**	0.0318**	0.0355***
			(0.0132)	(0.0139)	(0.0134)	(0.0130)
Constant	-0.00495	0.00117	-0.00374	-0.0112	0.00911	-0.0203
	(0.00436)	(0.00614)	(0.0194)	(0.0189)	(0.0265)	(0.0236)
country fixed effect	No	Yes	No	No	No	No
Observations	575	575	574	574	574	574
R-squared	0.203	0.532	0.227	0.234	0.228	0.257

Notes: Table shows results of a regression of the annualized log change in survey mean consumption or income per capita on the annualized log change in GDP per capita. Sample consists of all consecutive spells between 1981 and 2021, dropping spells with baseline and endline poverty rates lower than 2 percent. Robust standard errors in brackets. ***: Statistically significant at 1%; **: Statistically significant at 5%; *: Statistically significant at 10%.

Table 8: Passthrough between Household Final Consumption Expenditure (HFCE) growth from national accounts and household welfare growth from surveys

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
hfce_mean	0.711***	0.847***	0.747***	0.867***	1.031*	0.607**
	(0.117)	(0.176)	(0.123)	(0.147)	(0.549)	(0.269)
initial headcount gini			-0.00794	0.0192	0.0136	0.0133
			(0.0407)	(0.0493)	(0.0581)	(0.0405)
intial survey mean			-0.005***	-0.004***	-0.00453***	-0.004***
			(0.00135)	(0.00133)	(0.0013)	(0.00132)
interval			-0.000424	0.000170	-0.0002	-0.000270
			(0.00175)	(0.00168)	(0.002)	(0.00155)
Baseline: other regions						
SSA				0.0162*		
				(0.00864)		
hfce_mean x						
SSA				-0.685***		
				(0.255)		
initial headcount gini					-0.695	
					(1.314)	
Baseline: <2000						
2001-2009						0.00777
						(0.0148)
2010 and above						0.0189
						(0.0134)
hfce_change x						
2001-2009						0.281
						(0.309)
2010 and above						-0.0769
						(0.284)
Baseline: Consumption						
Income			0.0354**	0.0356**	0.0351**	0.0371***
			(0.0151)	(0.0150)	(0.0149)	(0.0141)
Constant	0.00466	0.0203***	0.0312**	0.00924	0.0214	0.00862
	(0.00490)	(0.00594)	(0.0142)	(0.0181)	(0.0232)	(0.0204)
country fixed effect	No	Yes	No	No	No	No
Observations	505	505	505	505	505	505
R-squared	0.198	0.444	0.249	0.267	0.250	0.268

Notes: Table shows results of a regression of the annualized log change in survey mean consumption or income per capita on the annualized log change in private household expenditure per capita as measured from national accounts. Sample consists of all consecutive spells between 1981 and 2021, dropping spells with baseline and endline poverty rates lower than 2 percent. Sample drops from 575 to 505 because for some countries data on private household expenditures from national accounts are missing. Robust standard errors in brackets. ***: Statistically significant at 1%; **: Statistically significant at 5%; *: Statistically significant at 10%.

Table 9: Variables affecting the passthrough between growth in GDP per capita and household welfare

	Survey mean to GDP (N=575)		Survey mean to GDP (N=1,604)		Poverty to GDP (N=575)	
	(1)		(2)		(3)	
	Coefficient	Sharpened q value	Coefficient	Sharpened q value	Coefficient	Sharpened q value
current values						
Net primary school enrolment	0.014	0.14	0.008	0.28	-0.04**	0.044
Literacy rate, youth total (% of people ages 15-24)	0.018	0.208	0.013*	0.076	-0.068***	0.001
Forest rents (% of GDP)	-0.039***	0.003	-0.023	0.229	0.103***	0.003
Mineral rents (% of GDP)	-0.103**	0.037	-0.011	0.945	0.069	0.81
Ores and metals exports (% of merchandise exports)	-0.028**	0.033	-0.003	0.945	0.011	0.933
Access to electricity (% of population)	0.008**	0.037	0.004	0.237	-0.026***	0.003
People using at least basic drinking water services (% of population)	0.013*	0.085	0.007	0.334	-0.03	0.215
People using at least basic sanitation services (% of population)	0.007	0.208	0.004	0.441	-0.031**	0.047
Number of deaths from conflicts per 1000 people	-7.475*	0.066	-4.527	0.222	12.486	0.563
lagged 5 years						
Agriculture, value added (% of GDP)	-0.016**	0.041	-0.01	0.173	0.014	0.491
Employment in services (% of total employment) (modeled ILO estimate)	0.014*	0.099	0.006	0.099	-0.026	0.099
Ores and metals exports (% of merchandise exports)	-0.028***	0.008	-0.007	0.008	0.008	0.008
lagged 10 years						
Agriculture, value added (% of GDP)	-0.019***	0.004	-0.011*	0.055	0.037	0.151
Industry, value added (% of GDP)	0.019**	0.031	0.012	0.12	-0.037	0.176
Employment in services (% of total employment) (modeled ILO estimate)	0.018*	0.061	0.005	0.507	-0.03	0.176
Employment in industry, (% of total employment) (modeled ILO estimate)	0.05***	0.001	0.016*	0.096	-0.037	0.262
Ores and metals exports (% of merchandise exports)	-0.022*	0.063	-0.004	0.79	0.005	0.654
People using at least basic sanitation services (% of population)	0.009*	0.095	0.007*	0.082	-0.034	0.151

Notes: Numbers in the table show the estimated coefficients of the interaction term between growth in GDP per capita and the corresponding variable listed in the first column, as well as the Anderson's sharpened q values to control for multiple hypotheses testing. "Current values" indicates that the mediating variable is measured at the beginning year of the spell. "Lagged 5 years" indicates that the mediating variable is measured five years prior to the beginning year of the spell. "Lagged 10 years" indicates that the mediating variable is measured ten years prior to the beginning year of the spell. All regressions include regional dummies to control for time-invariant omitted variables at the regional level. In the regressions of survey means on GDP per capita ((1) and (2)), a positive coefficient indicates that higher levels of the mediating variable amplify the effect of GDP growth on household consumption (and vice versa). In the regression of poverty on GEP per capita (3), a positive coefficient indicates that higher levels of the mediating variable weaken the effect of GDP growth on poverty. ***: Statistically significant at 1%; **: Statistically significant at 5%; *: Statistically significant at 10%.

Table 10: Variables affecting the passthrough between growth in HCFE per capita and household welfare

	Survey mean to HFCE (N=505)		Survey mean to HFCE (N=1,482)		Poverty to HFCE (N=505)	
	-1		-2		-3	
	Coefficient	Sharpened q value	Coefficient	Sharpened q value	Coefficient	Sharpened q value
current values						
Literacy rate, adult total (% of people ages 15 and above)	0.016*	0.058	0.009*	0.064	-0.034**	0.025
Literacy rate, youth total (% of people ages 15-24)	0.025**	0.011	0.016**	0.017	-0.051***	0.004
School enrollment, secondary (% gross)	0.016***	0.001	0.009***	0.002	-0.033*	0.081
Primary completion rate, total (% of relevant age group)	0.018**	0.021	0.013**	0.029	-0.037	0.126
School enrollment, primary (% gross)	0.019*	0.084	0.011*	0.087	-0.037	0.202
School enrollment, tertiary (% gross)	0.022***	0.001	0.009***	0.002	-0.036	0.16
Expenditure on secondary education (% of government expenditure on education)	0.022***	0.005	0.014*	0.054	0.024	0.268
Urban population (% of total)	0.02***	0.001	0.01***	0.002	-0.044**	0.036
Rural population (% of total population)	-0.02***	0.001	-0.01***	0.002	0.044**	0.036
Urban population growth (annual %)	-0.157**	0.029	-0.094***	0.007	0.432*	0.087
Age dependency ratio (% of working-age population)	-0.022***	0.004	-0.011***	0.006	0.059**	0.031
Fertility rate, total (births per woman)	-0.274***	0.004	-0.164***	0.002	0.716**	0.031
Mortality rate, under-5 (per 1,000 live births)	-0.011***	0.001	-0.007***	0.002	0.023**	0.026
Mortality rate, under-5, female (per 1,000 live births)	-0.012***	0.001	-0.007***	0.002	0.025**	0.025
Mortality rate, under-5, male (per 1,000 live births)	-0.011***	0.001	-0.006***	0.002	0.022**	0.026
Maternal mortality ratio (modeled estimate, per 100000 live births)	-0.001***	0.001	-0.001***	0.01	0.003**	0.026
Population growth (annual %)	-0.261**	0.012	-0.15***	0.002	0.585	0.148
Rural population growth (annual %)	-0.255***	0.001	-0.161***	0.002	0.351	0.173
Adolescent fertility rate (births per 1,000 women ages 15-19)	-0.009***	0.007	-0.006***	0.002	0.018	0.111
Life expectancy at birth, total (years)	0.051***	0.001	0.028***	0.002	-0.049	0.189
Wage and salaried workers, total (% of total employment) (modeled ILO estimate)	0.02***	0.001	0.007**	0.015	-0.043*	0.072
Employment in agriculture (% of total employment)	-0.023***	0.001	-0.012***	0.001	0.038*	0.081
Employment in services (% of total employment) (modeled ILO estimate)	0.026***	0.001	0.015***	0.002	-0.045*	0.081
Agriculture, value added (% of GDP)	-0.028**	0.014	-0.022***	0.002	0.049	0.148
Employment in industry, (% of total employment) (modeled ILO estimate)	0.053***	0.001	0.02**	0.015	-0.09	0.111
Rural accessibility index	1.242**	0.029	1.075***	0.002	-1.109	0.385
Access to electricity (% of population)	0.012***	0.005	0.005**	0.038	-0.034**	0.025
People using at least basic drinking water services (% of population)	0.028***	0.001	0.018***	0.003	-0.045*	0.078
People using at least basic sanitation services (% of population)	0.013***	0.004	0.007**	0.015	-0.035**	0.025

	Survey mean to HFCE (N=505)		Survey mean to HFCE (N=1,482)		Poverty to HFCE (N=505)	
	-1		-2		-3	
	Coefficient	Sharpened q value	Coefficient	Sharpened q value	Coefficient	Sharpened q value
Access to electricity, rural (% of rural population)	0.01***	0.007	0.004*	0.054	-0.03**	0.026
Conflict in any year of spell based on 0.08 death rate per 1000	-0.429	0.18	-0.275*	0.054	1.036	0.173
Average conflict deaths per 1000	-1.599	0.522	-6.051**	0.015	-14.478	0.359

Notes: Numbers in the table show the estimated coefficients of the interaction term between growth in HFCE per capita and the corresponding variable listed in the first column, as well as the Anderson's sharpened q values to control for multiple hypotheses testing. "Current values" indicates that the mediating variable is measured at the beginning year of the spell. All regressions include regional dummies to control for time-invariant omitted variables at the regional level. In the regressions of survey means on GDP per capita ((1) and (2)), a positive coefficient indicates that higher levels of the mediating variable amplify the effect of GDP growth on household consumption (and vice versa). In the regression of poverty on GEP per capita (3), a positive coefficient indicates that higher levels of the mediating variable weaken the effect of GDP growth on poverty. ***: Statistically significant at 1%; **: Statistically significant at 5%; *: Statistically significant at 10%.

Annex

Annex Table 1: Descriptive elasticities across regions, all spells (N=1,604)

	Mean			Median		
	Poverty to survey mean	Poverty to GDP per capita	Survey mean to GDP per capita	Poverty to survey mean	Poverty to GDP per capita	Survey mean to GDP per capita
East Asia and Pacific	2.2	-16.4	4.1	-3.0	-1.8	0.6
Europe and Central Asia	-42.0	4.7	-6.0	-3.0	-3.9	0.8
Latin America and Caribbean	-5.4	-20.3	2.7	-1.6	-2.8	1.1
Middle East and North Africa	-23.9	-4.0	1.0	-3.3	-5.1	0.9
North America	5.3	1.2	0.6	0.0	0.0	0.6
South Asia	-6.0	6.4	-0.1	-2.9	-2.5	1.1
Sub-Saharan Africa	-1.3	-1.8	1.3	-1.0	-1.1	0.8
Total	**-17.6**	**-3.8**	**-0.8**	**-1.8**	**-2.1**	**0.8**

Notes: Figures in the table show the percentage change in the poverty headcount for a one percent change in household consumption per capita or GDP per capita, and the percentage growth in household consumption expenditures (as measured from surveys) for a one percent growth in GDP per capita.

Annex Table 2: List of variables included as potential mediating factors between economic growth and household welfare

	Variable used a potential mediating factor
1	Population growth (annual %)
2	Urban population (% of total)
3	Rural population (% of total population)
4	Rural population growth (annual %)
5	Urban population growth (annual %)
6	Population in urban agglomerations of more than 1 mln (% of tot pop)
7	Age dependency ratio (% of working-age population)
8	Fertility rate, total (births per woman)
9	Adolescent fertility rate (births per 1,000 women ages 15-19)
10	Mortality rate, under-5 (per 1,000 live births)
11	Mortality rate, under-5, female (per 1,000 live births)
12	Mortality rate, under-5, male (per 1,000 live births)
13	Maternal mortality ratio (modeled estimate, per 100000 live births)
14	Life expectancy at birth, total (years)
15	Wage and salaried workers, total (% of total employment) (modeled ILO estimate)
16	Agriculture, value added (% of GDP)
17	Industry, value added (% of GDP)
18	Employment in industry, (% of total employment) (modeled ILO estimate)
19	Services, etc., value added (% of GDP)
20	Share of youth not in education, employment or training, total (% of youth pop)
21	Access to electricity (% of population)
22	Gross fixed capital formation (% of GDP)
23	Domestic credit to private sector (% of GDP)
24	Coal rents (% of GDP)
25	Forest rents (% of GDP)
26	Mineral rents (% of GDP)
27	Natural gas rents (% of GDP)
28	Oil rents (% of GDP)
29	Rents on coal, gas, oil, min, without forests in value added % of GDP
30	Employment in agriculture (% of total employment)
31	Population in the largest city (% of urban population)
32	Literacy rate, adult total (% of people ages 15 and above)
33	Literacy rate, youth total (% of people ages 15-24)
34	Inflation, consumer prices (annual %)
35	Trade in % of GDP
36	Labor force with primary education (% of total)
37	Primary completion rate, total (% of relevant age group)
38	School enrollment, primary (% gross)
39	School enrollment, primary (% net)

	Variable used a potential mediating factor
40	Share of public expenditure for primary education (% of public education expend)
41	School enrollment, tertiary (% gross)
42	School enrollment, secondary (% gross)
43	Government expenditure on education, total (% of GDP)
44	People using at least basic drinking water services (% of population)
45	People using at least basic sanitation services (% of population)
46	Individuals using the Internet (% of population)
47	Mobile cellular subscriptions
48	Access to electricity, rural (% of rural population)
49	regime is authoritarian or hybrid
50	1 minus the correlation coefficient between respondent and parents' years of sch
51	Pr child surpasses parent's educational category
52	Regime is authoritarian
53	Rural accessibility index
54	Employment in services (% of total employment) (modeled ILO estimate)
55	Ores and metals exports (% of merchandise exports)
56	Expenditure on secondary education (% of government expenditure on education)
57	Share of primary education expenditure in GDP
58	Share of secondary education expenditure in GDP
59	Voice and Accountability, Estimate
60	Political Stability and Absence of Violence/Terrorism, Estimate
61	Government Effectiveness, Estimate
62	Regulatory Quality, Estimate
63	Rule of Law, Estimate
64	Control of Corruption, Estimate
65	Coverage of social protection and labor programs (% of population)
66	Conflict in any year of spell based on 1000 deaths
67	Conflict in any year of spell based on 0.08 death rate per 1000
68	Average conflict deaths per 1000

Annex Table 3: Averages of selected development indicators for Sub-Saharan Africa and the World in 2019

Indicators	2019	
	SSA	World
Urban population (% of total)	40.8	55.6
Urban population growth (annual %)	4.0	1.9
Fertility rate, total (births per woman)	4.7	2.4
Mortality rate, under-5 (per 1,000 live births)	77.2	39.3
Literacy rate, youth total (% of people ages 15-24)	77.1	91.7
Primary completion rate, total (% of relevant age group)	70.6	89.9
School enrollment, tertiary (% gross)	9.5	39.2
Access to electricity (% of population)	47.0	89.9
People using at least basic drinking water services (% of population)	63.6	89.7
People using at least basic sanitation services (% of population)	32.3	76.9
Agriculture, value added (% of GDP)	16.5	4.0
Forest rents (% of GDP)	2.2	0.2
Employment in services (% of total employment) (modeled ILO estimate)	36.4	50.6

Notes: Numbers in the table are drawn from WDI.