Problem Set

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According to the World Bank, Malawi is one of the poorest countries in the world, with a high population density and a young, fast-growing population. In comparison to its neighboring countries and the Sub-Saharan African average, Malawi's per capita income has remained relatively stagnant over three decades, which poses additional challenges for the country when it comes to solving persistent poverty.

In this report, we undertake an analysis of Malawi's poverty and inequality indicators with the goal of aiding policymakers in the country design strategies to overcome the most critical challenges. We begin by reviewing the World Bank's Malawi Poverty Assessment from 2016 to understand the context for the previous decades. We then analyze the current macroeconomic context for the 2016-2021 period, focusing on how Malawi performed in comparison to other countries in Sub-Saharan Africa. After that, we undertake a detailed assessment of Malawi's poverty and inequality indicators, making sure to adequately describe the profile of the poor in the country. Finally, we conclude by providing policy recommendations for the current government.

1 Review of the World Bank's Malawi Poverty Assessment

The World Bank's 2016 Malawi Poverty Assessment documents changes in poverty and shared prosperity in Malawi from 2004 to 2010, based on two cross-sectional household surveys (World Bank Group 2017). It then extends the analysis to poverty dynamics and its persistence in the country between 2010 and 2013, making use of the country's first nationally representative panel household survey. It explores the Multidimensional Poverty Index, which includes non-monetary deprivations, and how access to opportunities is distributed throughout the country. To conclude, the report looks specifically at topics like food security, drivers of poverty changes, agricultural productivity, non-farm employment, social protection and population changes.

1.1 Motivation

The World Bank's Malawi Poverty Assessment in 2016 was motivated by the need to understand poverty dynamics and to identify the most important points to help reduce poverty in Malawi.

In particular, Malawi stands out as one of the world's poorest nations, with 50% of its population living in poverty in 2010 and 25% living in extreme poverty. Despite a slight reduction in poverty between 2004 and 2010, poverty depth and severity increased. Malawi's poverty rate, considering individuals living below $1.90 per day of purchasing power parity (PPP), was 74% in 2004, similar to rates found in countries like Burundi and Madagascar.

More concerning is the fact that, while other countries in the region made progress, Malawi's poverty reduction was stagnant during the second half of the 2000s compared to the PPP line. In contrast, Mozambique and Tanzania, which had higher poverty rates from 2000 to 2005, experienced significant poverty reductions. Even countries with lower poverty rates at baseline, such as Rwanda and Uganda, made significant progress. This points to the acuteness

of the issue, which deserves careful attention from the international community as well as local policymakers.

The report also aimed to shed a light on the differences in poverty assessment between rural and urban areas, which is particularly pronounced in Malawi. From 2004 to 2010, poverty and ultra-poverty rates fell significantly in urban areas, along with a decrease in poverty depth and severity. However, poverty in rural areas remained stagnant and slightly increased, with extreme poverty rates increasing at a greater pace, widening the urban-rural income divide.

Finally, the study reports on inequality in the country, motivated by the fact that, despite experiencing significant growth, Malawi did not see a corresponding increase in GDP per capita. While GDP grew by an average of 5.9% per year from 2004 to 2011 and consumption per person increased by 13%, GDP per capita growth did not outpace the increases in population. This economic prosperity was severely unequal, with the consumption of the bottom 40% falling by 5%, while growing 30% for the top 10%. In rural areas, two-thirds of the population experienced negative real consumption growth. Economic growth was driven largely by urban-oriented sectors, which seemed to not benefit the largest share of the population. The growth elasticity of poverty in Malawi according to the $1.25 international poverty line during the period was -0.2, which compares poorly with other countries in the region and a global average of -2.0.

1.2 Analytical Tools

The report used several analytical tools to analyze poverty and inequality.

First of all, they made use of different surveys, both cross-sectional and panel. The former (IHS2 from March 2004-February 2005 and IHS3 from March 2010-March 2011) helped researchers compare measures between the two different time periods, while the latter (IHPS) followed the same cohort of 3,247 households between 2010 and 2013, which allowed them to measure poverty dynamics and understand whether households moved in or out of poverty.

They also used several metrics to capture the full extent of the poverty issue. This included monetary poverty, comparing household consumption per capita with national poverty lines, and Growth Incidence Curves to plot consumption growth rates against percentiles. The growth elasticity of poverty measured the percentage change in the poverty headcount for each percentage change in consumption. The poverty gap is the average consumption shortfall of the population relative to the poverty line, while the poverty squared gap takes into account the distribution of consumption among the poor.

The IHS3-IHPS panel survey was used to measure the effects and relative contributions of household and community characteristics on the probability of continuing to be poor in 2013, for the households who were poor in 2010. For that, they used a probit model, presenting only characteristics that were statistically significantly different in the survey.

The Gini coefficient and entropy indices were used to analyze inequality. Finally, the report also used the Multidimensional Poverty Index (MPI), which covers three dimensions: health, education, and living standards, and uses specific indicators to determine if people are deprived in these areas. A household is considered multidimensionally poor if its weighted sum of the 10 deprivations is at least 0.33.

1.3 Main Results

The assessment on poverty and inequality in Malawi came to several very interesting conclusions.

First, consumption inequality in Malawi increased from 2004 to 2010, with the bottom 40% experiencing a larger decline in their share than the top 10%, resulting in a wider gap between the two groups. The increase in inequality was more pronounced in rural areas, even though the urban areas had higher inequality to begin with. The Gini coefficient increased from 0.39 to 0.45, indicating a wider income gap between rich and poor. The increase in consumption concentration was mainly due to greater rural inequality, while urban inequality remained relatively stable during this period.

On the other hand, between 2010 and 2013, the incidence of poverty in Malawi (restricted to the non-lean months of the panel survey) fell from 40.2% to 38.7%, with urban areas displaying a considerable increase in poverty and rural areas seeing a slight decline. This narrowed the urban-rural poverty gap. They note, however, that these statistics may underestimate poverty by not accounting for decreasing consumption during the lean season.

In terms of the profile of those in poverty, poor households tend to have more women as heads of household and higher dependency ratios, less education, and limited access to assets and services. They typically have more members, including children and the elderly, and rely heavily on farm employment, which tends to have lower returns than non-agricultural wage employment. Poor households also have limited access to credit and public utilities, with almost no access to electricity or running water. However, access to improved sanitation is similar for poor and non-poor households. Additionally, poverty is disproportionately concentrated in rural areas. Interestingly, there are fewer distributional differences among the population when the country is divided by region.

One of the main ideas from the report is that poverty is dynamic. The poor can be subdivided into those who remain poor continuously over time, the chronically poor, and those who are frequently moving in and out of poverty, the transient poor. Around two-thirds of Malawi's population did not experience mobility between 2010 and 2013: 44% remained non-poor, while 23% stayed poor. The latter are considered chronically poor, the proportion of which is double in rural areas compared with urban ones. The rest of the population was split between the 17% who escaped poverty since 2010 and the 15% who became poor since 2010. This means that approximately 60% of total poverty in the country was chronic and persisted throughout the years.

A second idea is that poverty transitions can be driven by changes in household composition and demographics, because the profiles of the non-poor, chronically poor and transient poor are quite distinct. For starters, household size plays a role: the chronically poor have the highest number of people living together and those who became poor increased household size notably between rounds, while the opposite occurred for those who exited poverty. In particular, those who became poor or were chronically poor had more children than the non-poor. Additionally, the chronically poor had household heads who were older, more likely female and with less education than both the non-poor and the recently poor.

This group was also shown to have less assets and wealth; an index that comprises durable goods and dwelling infrastructure displayed a large and significant variation between the non-poor (0.62) and those who moved out of poverty (0.40), fell into poverty (0.36) and chronically poor (0.30). Consumption per person did not swing across rounds for those who did not witness

poverty mobility, but displayed huge variations for households who crossed the poverty line. In general, those who exited poverty experienced an increase in their assets and those who moved into poverty experienced a drop.

Finally, the report argues that access to basic services, such as education, health care, and water and sanitation, is important for poverty transitions. Advances in access to utilities and sanitation were very limited between 2010 and 2013, benefiting primarily those at the higher end of the income distribution. The share of rural families without electricity or running water is almost universal. However, looking at poverty from a multidimensional perspective, Malawi witnessed notable reductions in the proportion and intensity of poverty between 2004 and 2013, particularly for the rural areas before 2010. This was largely due to great advances in education and health outcomes, which put its performance in multidimensional poverty reduction over the entire first decade of the century above that of similar countries.

However, although school access and enrollment has improved over the years, the public education system produces weak educational outcomes. The health sector is still largely dependent on external resources. Despite the progress made, access to many basic services is neither universal nor equitable.

1.4 Policy Recommendations

The main policy recommendations from the Malawi Poverty Assessment are around addressing the heterogeneity between groups in the country. Findings indicate that the rural and urban poor differ significantly, not just in terms of numbers but also in profile. Any policy must deal with these two groups separately. Additionally, there is large share of chronic poverty in Malawi. Interventions targeted at this group specifically could help reduce long-term poverty by ensuring some mobility.

A focus on the factors that drive poverty transitions could also ensure more effective policy solutions. For instance, a household head with tertiary education reduced the likelihood of continuing in poverty by 23 percentage points. The probability of continuing to be poor increased by 7 percentage points for each extra member in the second round; this was lower for older children (5-7 p.p.) compared to younger ones (9 p.p.), and much higher for every additional senior aged 65 or older (18 p.p.).

Finally, it is essential to improve access and quality of basic services, such as infrastructure and electricity, as connectivity plays a role for the chronically poor. Despite progress made in some non-monetary dimensions, there was relative lack of progress in others and policymakers should ensure equitable access to opportunities and services for everyone.

1.5 Further Analysis

As previously mentioned, a poverty assessment for Malawi must focus on key groups that have different poverty profiles. First, it is important to understand how these profiles vary once regional disparities are taken into account. It also crucial to treat the urban poor differently from the rural poor, as policies will likely need to be targeted to each context, as well as the chronic poor and the transient poor. Finally, a more detailed analysis is needed to understand gender heterogeneity, as female-headed households tended to lag behind in access to non-monetary goods and services but fared better in terms of nutritional status.

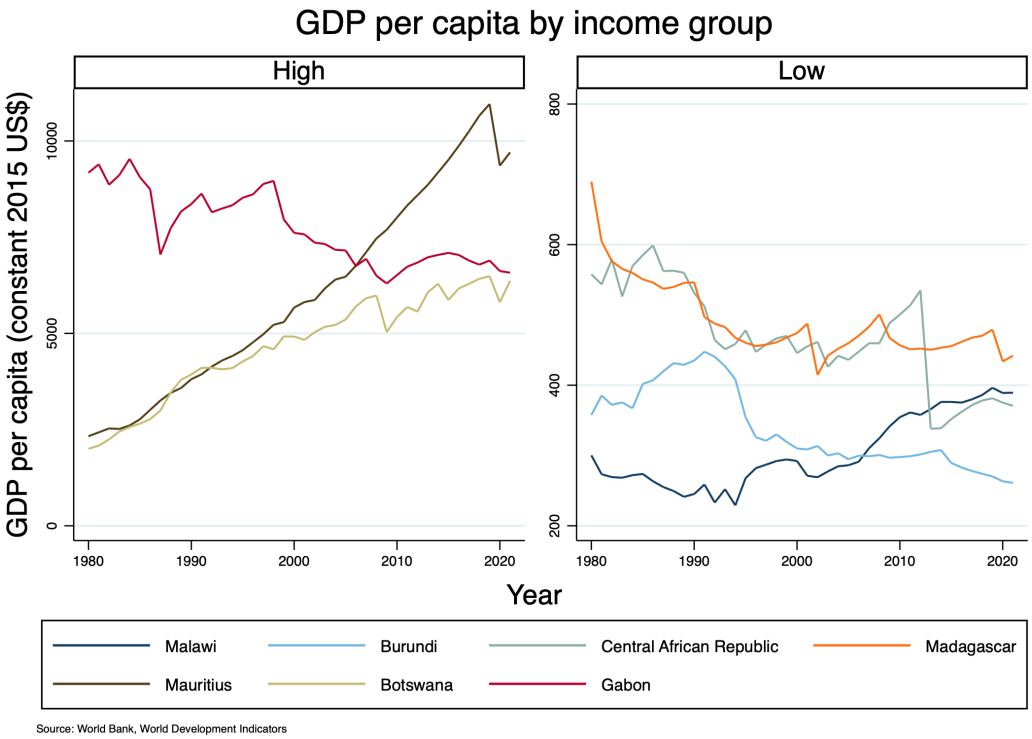
2 Macroeconomic Context

For the macroeconomic context analysis, we download data on the GDP per capita in constant 2015 USD for Malawi and the 3 richest and poorest sub-Saharan African countries over the 1980-2021 period, defining richest and poorest by the same indicator. However, we drop Seychelles from the richest group, as it is classified as a high-income economy by the World Bank, as well as Somalia, as there is no data before 2012. The time series is available in Figure 1.

For the relatively richer countries, we see that Botswana and Mauritius have seen a pretty constant increase in their GDP per capita since 1980, while Gabon has witnessed a decline. The big shock in 2020 for Mauritius is likely the COVID-19 pandemic, since tourism plays a big role in its economy. Botswana saw a setback in 2009 due to the global financial crisis.

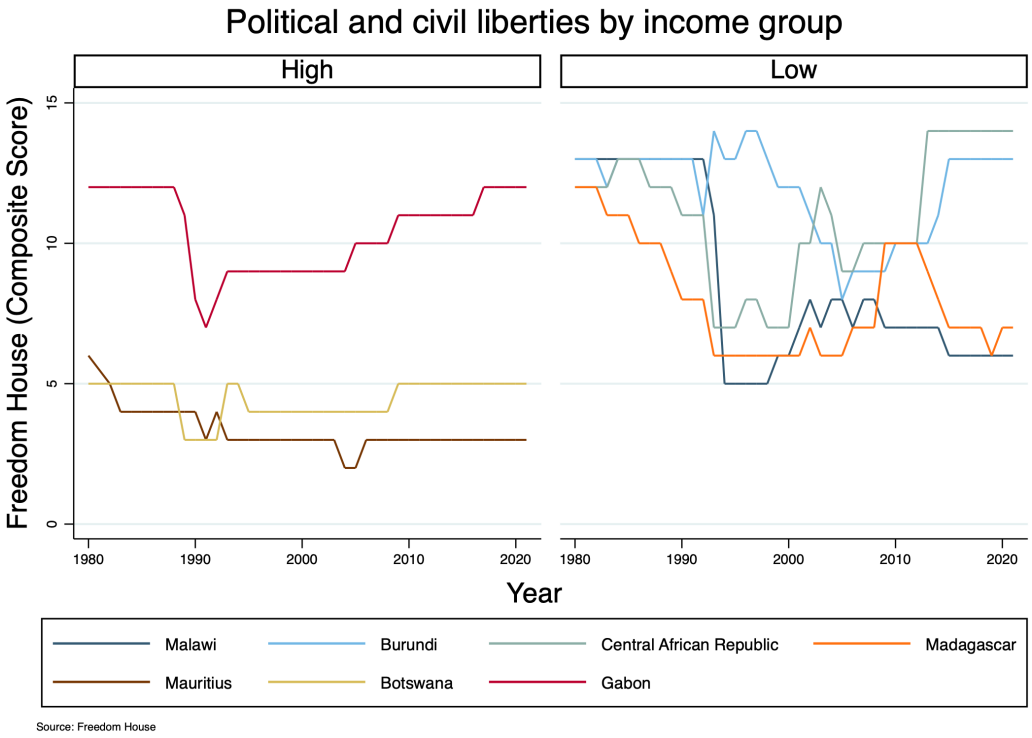
When it comes to the poorer countries, there is much more volatility throughout the years. The Central African Republic, for instance, had a sharp decline in GDP per capita in 2013, which coincides with the civil war that erupted at the end of 2012. Similarly, Madagascar's sudden drop in 2002 is likely a consequence of its 2002 political crisis, with mass protests and violent conflict following the presidential elections. Burundi's decline in the early 1990s also follows a civil conflict. Malawi faced the opposite situation, in which the referendum in 1993 that established a democratic government was followed by increases in GDP per capita.

Figure 1: GDP per capita for Malawi and the three richest and poorest countries in Sub-Saharan Africa (1980-2021)



For this reason, we plot Freedom House scores throughout time in Figure 2. These scores range between 1 and 14, in which higher scores mean more violations of political and civil rights. We expect the richer countries to have lower scores in general, or at least ones that trend lower over time, while those with low GDP per capita are expected to be more volatile, mirroring patterns seen in the previous graph.

Figure 2: Freedom House score for Malawi and the three richest and poorest countries in Sub-Saharan Africa (1980-2021)



This is generally the case, with richer countries maintaining consistently lower score over time. Gabon's score drops from 11 to 8 in 1990, which is enough to classify it as a "partly free" nation. This is consistent with both the increase in GDP per capita between 1988 and 1991, and the legalization of opposition parties and adoption of a new constitution.

As expected, low-income countries have higher scores on average and less stability. The Central African Republic's freedom score increased from 10 to 14 and its political status was elevated to "not free" at the time the civil war began. Madagascar's political crisis and Burundi's civil conflict generated a similar score shift. Finally, the establishment of a democratic government in Malawi also reduced its score from 13 in 1992 to 5 in 1994.

3 Poverty Assessment

3.1 Correlates of Poverty

In Table 1 we present multiple indicators related to non-poverty, poverty, and ultra-poverty, along with their values in two different periods (2016/17 and 2019/20), taken from the Integrated Household Survey on the World Bank's website ("Microdata Library"). We also include the difference in the values between the two periods for each indicator and for each poverty category.

The table presents interesting insights into poverty and welfare indicators in Malawi. For instance, households categorized as ultra-poor have lower levels of consumption per capita, higher percentage of heads of households who are female, higher percentage of rural location, and larger household size compared to non-poor households. The differences between the three groups are mostly significant. This is in line with the World Bank's 2016 Poverty Assessment, and shows

Table 1: Main indicators for non-poverty, poverty and ultra-poverty

Selected Indicators	2016/17 A Non poor	B Poor	C Ultra poor	(A-B) Diff.	(B-C) Diff.	2019/20 A Non poor	B Poor	C Ultra poor	(A-B) Diff.	(B-C) Diff.
Welfare indicators										
Consump. PC (000s MK)	290.9	110.0	65.3	180.9*** [7.65]	44.7*** [108.8]	340.0	132.5	77.5	207.5*** [31.7]	55.1*** [99.3]
% Consump. to food	0.571	0.637	0.624	-0.066*** [-23.8]	0.013*** [3.89]	0.544	0.588	0.595	-0.044*** [-14.7]	-0.007* [-1.77]
Head										
% female head	0.267	0.300	0.333	-0.033*** [-3.58]	-0.033** [-2.57]	0.284	0.312	0.354	-0.028*** [-2.76]	-0.043*** [-2.92]
% head < primary	0.628	0.497	0.460	0.132*** [12.92]	0.037*** [2.64]	0.687	0.562	0.568	0.125*** [11.82]	-0.005 [-0.342]
Location										
% Rural	0.711	0.938	0.968	-0.227*** [-26.9]	-0.029*** [-4.79]	0.737	0.925	0.970	-0.188*** [-20.9]	-0.045*** [-6.14]
Region South	0.429	0.476	0.545	-0.047*** [-4.57]	-0.069*** [-4.96]	0.457	0.491	0.446	-0.034*** [-3.08]	0.046*** [2.92]
Region Center	0.358	0.329	0.294	0.029*** [2.95]	0.035*** [2.68]	0.300	0.380	0.481	-0.080*** [-7.72]	-0.101*** [-6.56]
Region North	0.214	0.196	0.161	0.018** [2.14]	0.034*** [3.19]	0.243	0.129	0.073	0.114*** [12.66]	0.056*** [5.71]
Households										
Household size	3.774	4.742	5.498	-0.967*** [-24.9]	-0.756*** [-14.5]	3.825	5.099	5.756	-1.274*** [-29.6]	-0.657*** [-10.7]
% HH own business	0.225	0.138	0.088	0.087*** [10.58]	0.050*** [5.52]	0.284	0.229	0.176	0.055*** [5.63]	0.053*** [4.14]
% water in dwelling	0.078	0.003	0.000	0.075*** [16.42]	0.003** [2.56]	0.047	0.004	0.001	0.043*** [10.69]	0.003 [1.52]
Persons per room	1.714	2.294	2.713	-0.580*** [-24.8]	-0.419*** [-10.9]	1.502	2.087	2.644	-0.585*** [-27.8]	-0.557*** [-14.3]
Total observations	6,879	3,560	2,008			6,966	2,879	1,589		

Source: own calculations based on Malawi IHS4 and IHS5 (World Bank).
Tests used for difference in means: $t-test$ for continuous variables and $chi-2$ for percentages values. Statistics are reported in brackets.
Significance levels of the difference: 1%(***), 5%(**), and 10%(*).

that little has changed in terms of profile over the years. Additionally, the data indicates that poverty has decreased between 2016/17 and 2019/20, with an increase in consumption per capita across the board and a decrease in households below the poverty line.

Aggregating the data from the surveys also reveals regional differences in poverty rates, with households in the north experiencing higher poverty rates than those in the south or center. In addition, it shows that the percentage of households owning businesses and having water inside the dwelling is lower for ultra-poor households compared to non-poor households, indicating that these households are less likely to have access to basic services and economic opportunities.

3.2 Poverty Profile

Figure 3 shows Malawi's poverty profile for 2016/2019. If we pick any consumption level on the $x-axis$, the Cumulative Distribution Function (CDF) will tell us the percentage of individuals in the population having a level of consumption lower than x. This is an effective indicator of the incidence of poverty and their evolution.

3.3 Poverty Indicators

In Table 3 we present three poverty indicators for Malawi in 2016 and 2019, namely incidence, gap, and gap squared. The incidence refers to the proportion of the population that lives below the poverty line, which decreased from 51.8% in 2016 to 47.2% in 2019. The gap measures

Figure 3: Poverty Incidence Curve
(Malawi IHS 2016/2019)

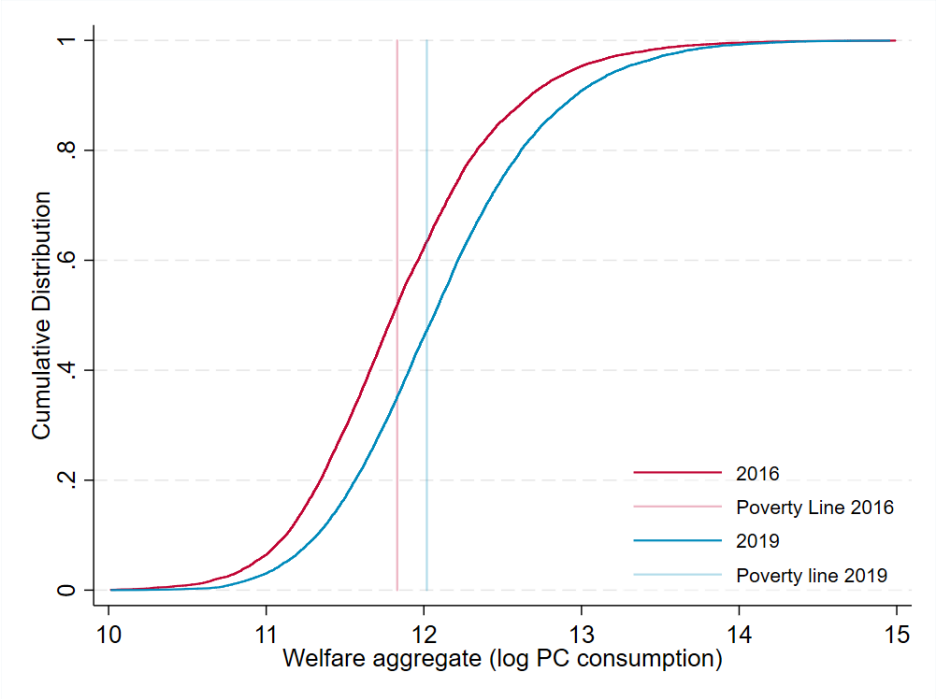


Table 2: Poverty lines in Malawi for 2016 and 2019 (in MWK)

	2016	**2019**
P_0	137,425	165,879
P_1	85,259	101,293
P_2	55,729	67,368

the depth of poverty by computing the average shortfall of the poor from the poverty line, as a proportion of the poverty line. The gap decreased from 17% in 2016 to 15.5% in 2019, indicating that the poor were closer to the poverty line in 2019 than in 2016. Finally, the gap squared measures the severity of poverty by giving more weight to those further below the poverty line. The gap squared decreased from 7.5% in 2016 to 6.9% in 2019, implying that the poorest of the poor were slightly less disadvantaged in 2019 than in 2016.

When we examine the indicators separately for urban and rural areas, we find that poverty is higher in rural areas than in urban areas, both in 2016 and 2019. However, the rural-urban gap in poverty narrowed slightly over time, as shown by the decreasing gap and gap squared indicators for both years. This suggests that poverty reduction efforts in Malawi have been more successful in rural areas than in urban areas.

The table also provides information on poverty by the education level of the household head. The results show that poverty is higher among households where the head has less than 6 years of education, compared to those with more than 6 years of education. However, the poverty incidence decreased for both education groups between 2016 and 2019. The poverty gap and gap squared also decreased, indicating a reduction in poverty depth and severity for both education groups. Nonetheless, poverty remains more severe for households with less-educated heads, as shown by the higher gap and gap squared values.

Table 3: Measures of poverty, 2016 and 2019

	Incidence		Gap		Gap squared	
	2016	2019	2016	2019	2016	2019
Malawi	0.518 [0.500]	0.472 [0.499]	0.170 [0.214]	0.155 [0.211]	0.075 [0.125]	0.069 [0.121]
Urban	0.159 [0.366]	0.175 [0.380]	0.041 [0.115]	0.041 [0.110]	0.015 [0.054]	0.014 [0.049]
Rural	0.597 [0.491]	0.535 [0.499]	0.198 [0.221]	0.179 [0.219]	0.088 [0.132]	0.080 [0.128]
Head educ $<$ 6y	0.612 [0.487]	0.550 [0.498]	0.207 [0.224]	0.179 [0.215]	0.093 [0.135]	0.078 [0.124]
Head educ $>$ 6y	0.442 [0.497]	0.425 [0.494]	0.140 [0.201]	0.141 [0.207]	0.060 [0.113]	0.063 [0.119]

Source: own calculations based on Malawi IHS4 and IHS5 (World Bank). Measures of poverty are based on household real per capita consumption attributed to individuals, and are calculated on an individual basis. Standard errors are reported in brackets.

The newer data in 2019 show a reduction in poverty incidence, depth, and severity in Malawi, indicating progress in poverty reduction efforts. However, poverty remains a significant challenge in both rural and urban areas, as well as among households with less-educated heads. The decreasing rural-urban gap in poverty suggests that the government's efforts to reduce poverty in rural areas have been effective.

4 Inequality Assessment

4.1 Inequality Indicators

Table 4: Theil Index and Gini coefficients for rural and urban populations in Malawi (weighting households by household size)

	2016		2019	
	Theil Index	Gini	Theil Index	Gini
Rural	0.287	0.323	0.203	0.335
Urban	0.709	0.445	0.293	0.392

Table 4 presents data on the Theil index and Gini coefficient for Malawi in 2016 and 2019, disaggregated by rural and urban areas. Looking at the table, we can see that in 2016, Malawi had higher levels of inequality in urban areas than in rural areas, as evidenced by the much higher Theil index and Gini coefficient values for urban areas compared to rural areas. However, by 2019, both the Theil index and Gini coefficient had decreased for both urban and rural areas, indicating that inequality had decreased somewhat over time.

Despite the decrease in inequality over time, Malawi still experiences relatively high levels of inequality, particularly in urban areas. The Theil index for urban areas in 2016 was still almost three times higher than that for rural areas, indicating that urban areas are more heterogeneous in terms of income distribution. The Gini coefficient for urban areas in 2019 was also higher

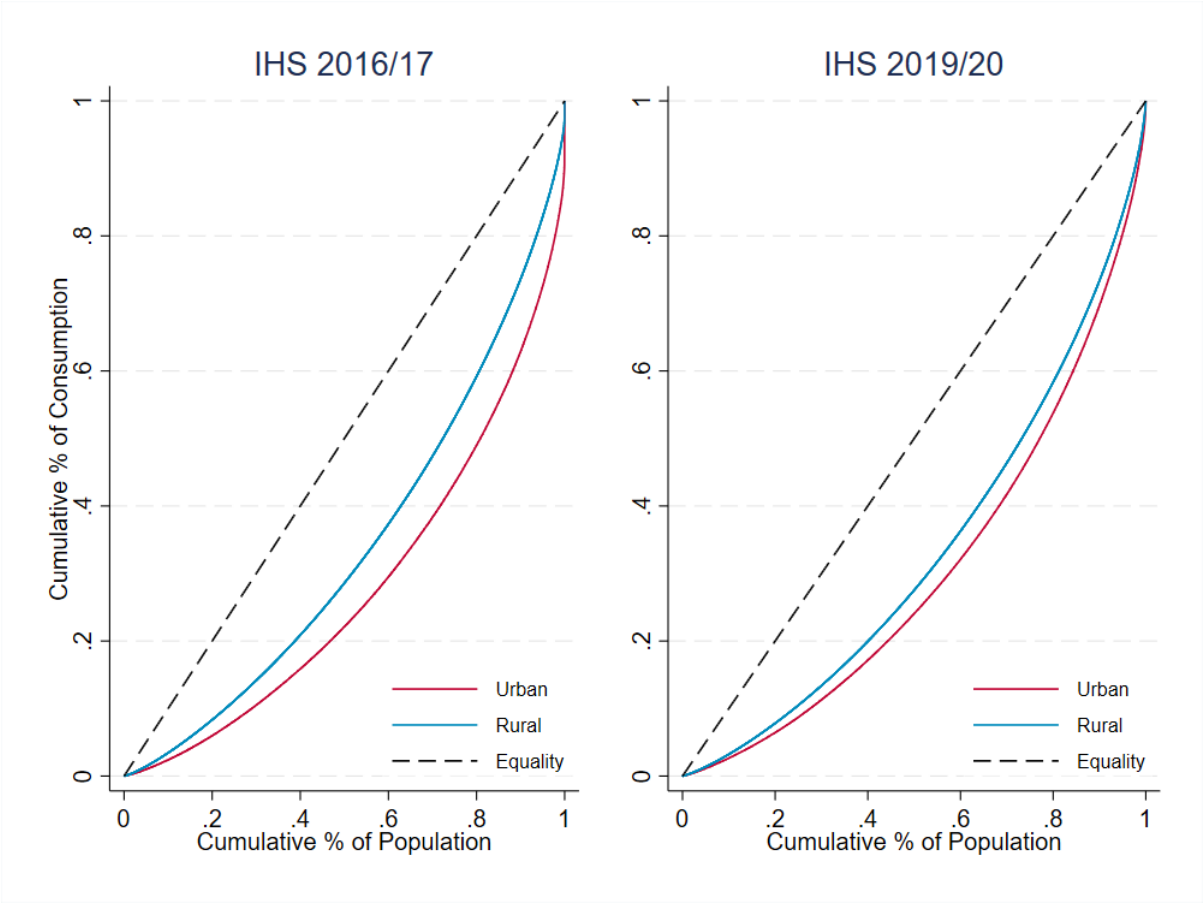
than that for rural areas, indicating that the gap between the rich and poor in urban areas is wider than in rural areas.

The data suggest that while Malawi has made some progress in reducing inequality over time, there are still significant differences in income distribution between urban and rural areas, with urban areas experiencing higher levels of inequality.

4.2 Lorenz Curves

In Figure 4 we examine income inequality between the the urban and rural populations of Malawi across 2016 and 2019 through two Lorenz graphs. The 2016 graph shows a larger gap between the Rural and Urban curves and the Rural curve being situated to the left of the Urban curve, indicating a lower share of income or wealth for the rural population. The 2019 graph shows a smaller gap between the curves, suggesting a decrease in income or wealth inequality, but the Rural curve still remains to the left of the Urban curve, indicating a lower inequality for the rural population. The Lorenz graphs demonstrate that income or wealth disparities persist between the rural and urban populations of Malawi, with the urban population lagging behind in terms of inequality.

Figure 4: Lorenz Curves
(Malawi IHS 2016/2019)



5 Conclusion and Policy Recommendations

5.1 Summary

In Section 1, we reviewed the World Bank's Malawi Poverty Assessment in 2016, which was motivated by the need to understand poverty dynamics and identify the most important points to help reduce poverty in Malawi. The report used several analytical tools to analyze poverty and inequality, including different surveys, metrics, and models, and shed light on the differences in poverty assessment between rural and urban areas, which is particularly pronounced in Malawi. The biggest takeaway was the need to address the heterogeneity between groups in the country, focus on factors driving poverty transitions, and improving access and quality of basic services.

Section 2 illustrated how the macroeconomic context influences GDP per capita in Sub-Saharan Africa, with large shifts explained by civil unrest and changes in the political atmosphere, as measured by the Freedom House index.

In examining both the 2016 and 2019 Integrated Household Surveys in Section 3, we can see that poverty has remained intractable, despite some improvement. For example, since 2010 the percent of people living below the poverty line has fallen from 50% to 47%. We have also shown that the nature of poverty is different depending on the setting – though poverty is less prevalent in urban areas, there is significantly greater inequality than in rural areas, as we have exposed in Section 4.

5.2 Policy Implications

Based on these findings, we believe it is important to continue to promote economic growth in rural areas, as living in a rural area is still very highly correlated with poverty. This can be done by increasing quality of infrastructure and access to public services, things that the ultra poor still lack.

Considering the large inequalities in urban areas, which have nonetheless improved over the years, it is also important to ensure that inequality continues to decrease in these settings. This is particularly crucial once we consider Malawi's young and fast-growing population, as more people will likely migrate to urban environments in the future.

Finally, to understand what has been effective in reducing income inequality in urban areas and poverty incidence and severity in rural locations, it is essential that further studies look to evaluate specific policies and programs implemented during the period in question. This will allow Malawi to focus its efforts on the particular strategies that yield the most benefit.

6 References

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