

Inequality Among the MPI Poor, and Regional Disparity in Multidimensional Poverty: Levels and Trends

Sabina Alkire and Suman Seth | June 2014

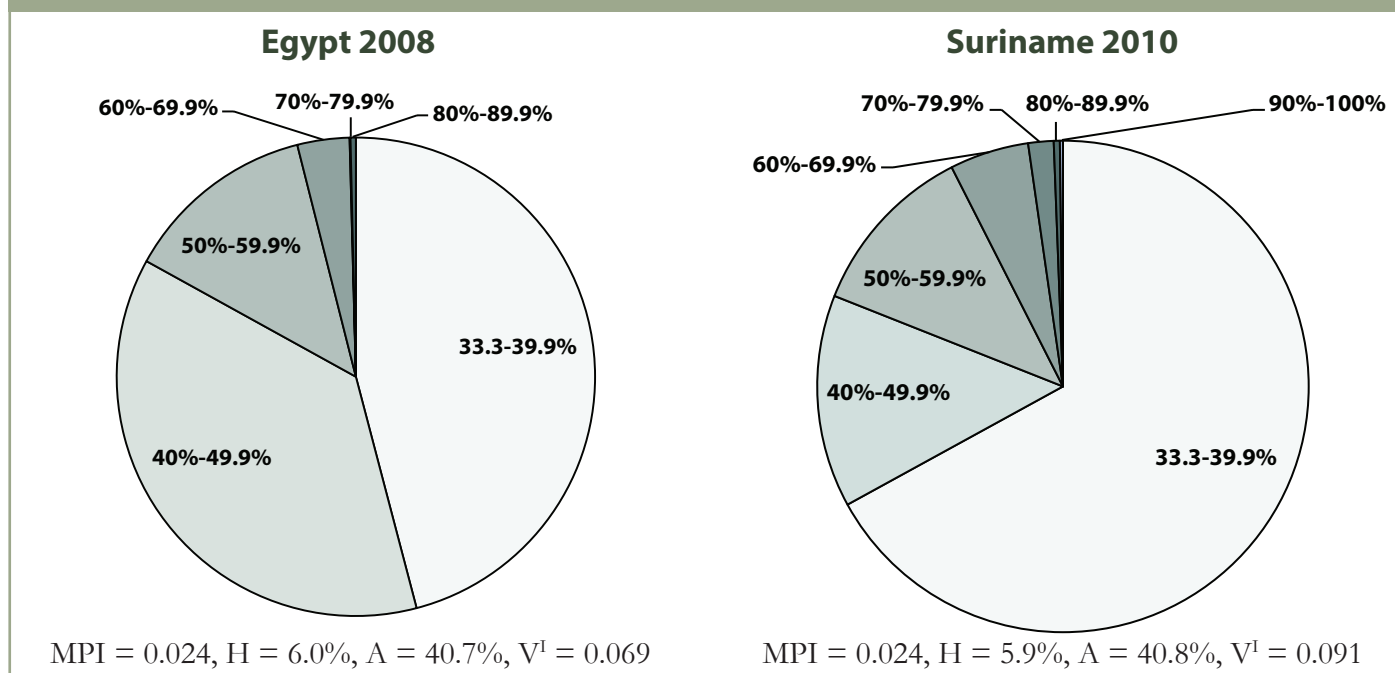
Poverty reduction is not necessarily uniform across all poor people in a country, or across population subgroups; an improvement overall may yet leave the poorest of the poor behind. Here we use a new measure to analyse *inequality among poor people in 90 countries*, and find the highest levels are to be found in 15 Sub-Saharan African countries; in Pakistan, India and Afghanistan; and in Yemen and Somalia.

This brief focuses on the distributional issues among the poor.

- We apply a new measure V^I to assess inequality in deprivation scores (individual deprivation profiles) among the poor. To introduce V^I , we present a clear example in which the multidimensional poverty levels of two countries are very similar, but the distributions of deprivations among the poor are starkly different.
- We measure inequality across the poor for **90 countries** and **780 sub-national regions** within 69 countries. Inequality levels increase as the global Multidimensional Poverty Index (MPI) becomes higher across countries but can differ widely for areas having the same MPI value (see Figure 2). Because V^I is sensitive to people who have high deprivation scores, it brings into view relatively small populations with very severe intensities.
- We analyse how inequality among MPI poor people has **changed in 34 countries**. In general, we find a positive story: nearly all countries that reduced MPI poverty also reduced **inequality among the poor**.
- We analyse changes in **subnational disparity in MPIs** – in other words, disparity between subnational MPI values – in 31 countries using a new measure V^D . Results show that national reductions in MPI are not shared uniformly across all sub-national regions within these countries. Less than half of the 31 countries analysed significantly reduced **sub-national disparity**. In those that did not reduce disparity, horizontal inequalities were replicated – or worse, the poorest groups were being left behind.



Figure 1: Distribution of Intensities in Egypt and Suriname



MOTIVATION

Inequality across society is a growing and highly prominent issue, as the gulf between rich and poor yawns ever wider. But inequalities among poor people and groups are also important. High levels of inequality among the poor signify that some people are living in very intense poverty, and horizontal inequalities in poverty levels and trends can inflame hostility and spark conflict (Stewart 2010). This briefing focuses on this narrow yet important topic: inequality among those people – and only those people – who are poor. Our new inequality measure **V^I** accurately summarises a great deal of empirical information, enabling policymakers to assess whether the very poorest of the poor have shared the benefits of poverty alleviation – both individually, and in groups.

The Global MPI is a product of the **incidence** of poverty (H) and the **intensity** of poverty (A) among the poor. As such, it captures two very important components. Now, we seek to understand a third important component: **inequality** across the poor. We use the Global MPI as our benchmark poverty measure, and use our new inequality measure, **V^I**, and our new regional disparity measure, **V^D**, alongside it. The ultimate objective is to **eradicate poverty**—not merely reduce inequality among the poor. Yet measures of inequality are tremendously useful in working towards this goal, because they illuminate pockets of high-intensity poverty that might otherwise be missed, helping us to ensure that there is ‘no one left behind’.

OUR NEW MEASURE: VARIANCE (V^I)

Our measure to assess inequality across the poor (**V^I**) is the variance of the deprivation scores, normalised between zero and one.¹ When all poor people have the same deprivation score, there is no inequality and the

measure is equal to zero. The measure takes the value of one when half of the poor people have the maximum possible deprivation score of 1, and the rest have the minimum possible deprivation score equal to the poverty cutoff, i.e. 1/3. The measure reflects absolute inequality, and it is subgroup decomposable so that one may study the contribution of each subnational region to overall inequality. The next section shows the practical insights such analysis can add.

WHAT V^I MAKES VISIBLE - COMPARING EGYPT AND SURINAME

Figure 1 compares Egypt and Suriname. Both countries have almost equal MPI, H and A, suggesting that multidimensional poverty is almost the same in each. However, they have a different distribution of intensities among the poor. In Suriname, two-thirds of poor people are barely poor, experiencing deprivation in 33.3-39.9% of the ten weighted indicators. Yet at the same time, a larger share of poor people in Suriname are deprived in 60% or more of weighted indicators than in Egypt – 7.4% vs 3.4%. So it appears that a particular section of the poor population in Suriname has remained highly deprived, even when the country as a whole enjoys low intensities of poverty. The variance measure **V^I** summarises and captures this difference in the distribution of intensities. In fact, **V^I** shows a statistically significantly higher level of inequality among the poor in Suriname than in Egypt.

INEQUALITY (V^I) AMONG THE MPI POOR BY COUNTRY

Figure 2 presents the relationship between MPI poverty and inequality among the poor across 90 developing countries. The horizontal axis shows the level of MPI poverty, with high-poverty countries on the right. The vertical axis charts inequality among the poor; higher is worse. Overall, there is

a positive relationship between MPI poverty and inequality; in other words, the higher the MPI value, the greater the level of inequality among the poor. However, there are differences: for example, Mauritania and Rwanda have very similar levels of MPI poverty, but Mauritania has much higher inequality. So too Nigeria has much higher inequality than Haiti.

The inequality measure V^I ranges from 0.006 in Belarus to 0.300 in Burkina Faso. If we consider the 20 countries with the highest inequality among the poor, their MPI values range from 0.230 in Pakistan to 0.605 in Niger. They include 15 Sub-Saharan African countries, as well as Yemen and Somalia from the Arab States, and Pakistan, India and Afghanistan in South Asia. Thus high inequality contexts are dominated by South Asia and Sub-Saharan Africa.

INEQUALITY (V^I) WITHIN SUB-NATIONAL REGIONS - SPOTTING POCKETS OF POVERTY

We also assess inequality among poor people within groups, defining groups by sub-national regions in this study.² Twelve sub-national regions have an inequality measure higher than 0.300. The highest levels of V^I by sub-national region are in three regions of Ethiopia, and one region each in Senegal, Niger and Burkina Faso. This is followed by four regions of Nigeria, another in Senegal and one in Pakistan.

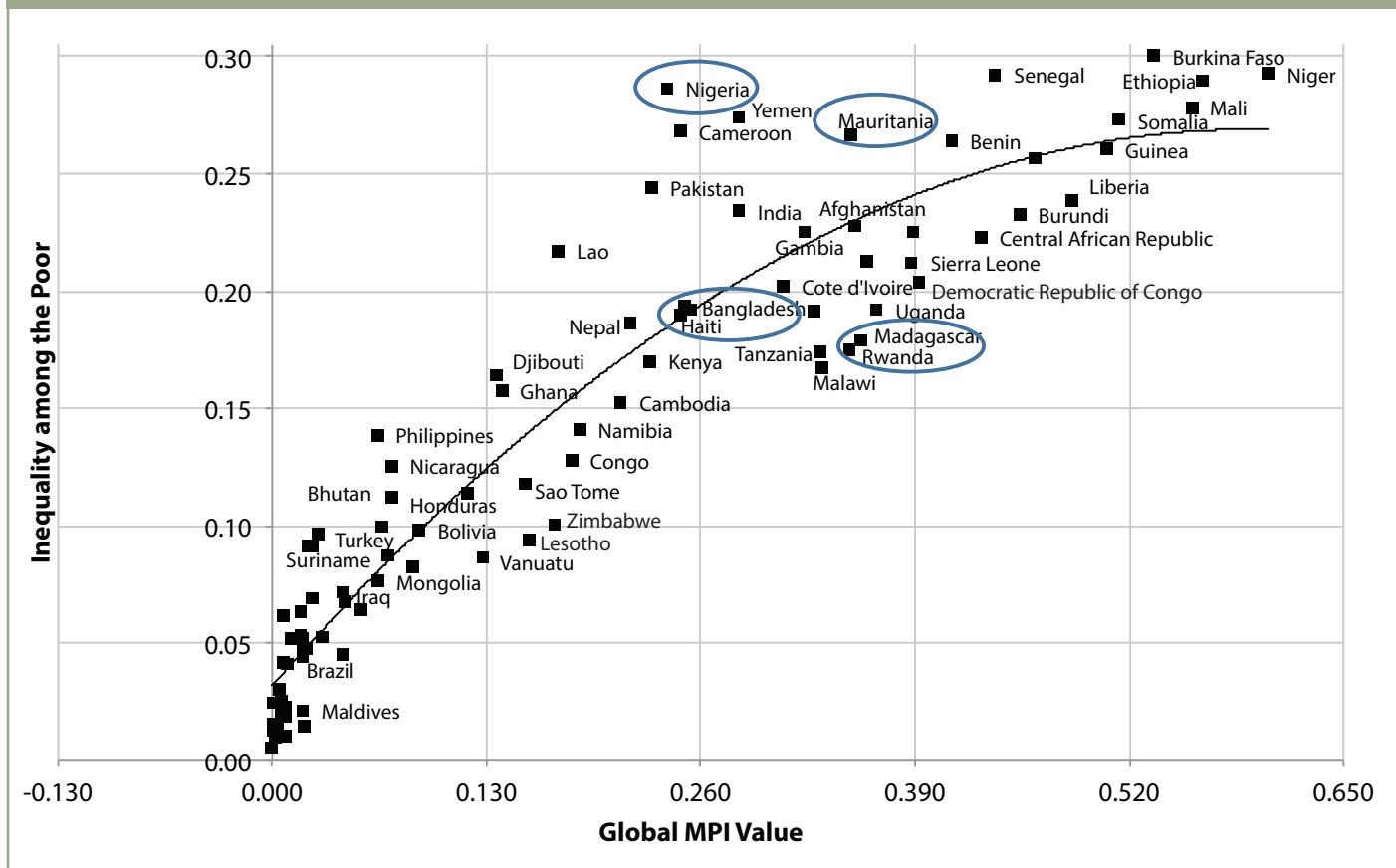
What is intriguing about these sub-national regions is that eight of the twelve have high MPI values at 0.5 or above;

and one (Nigeria’s Borno) has an MPI of 0.437. However, three regions have MPIs below 0.340. The first low-MPI, high-inequality region, which has the very highest inequality (V^I) of all 780 sub-national regions, is Ethiopia’s Dira Dawa. This is followed by Harari in Ethiopia, which has the fourth highest inequality out of 780, and Sindh in Pakistan.

Let us compare, for example, the regions of Affar and Harari in Ethiopia. In both, V^I is very high, at 0.32 and 0.33 respectively. However in Harari, the MPI value is 0.333 – 58% of people are poor and the average intensity of their poverty is 57%. In Affar, the MPI value is 0.663 – 91% of people are poor and the average intensity is 73%. The inequality measure V^I shows us at a glance that Harari has a pocket of very severely poor people – as does Sindh, in Pakistan.

We find the lowest inequality among the poor in regions of Uzbekistan, Suriname, Mexico and Moldova, which have zero inequality. In all cases this is due to very low poverty numbers and relatively small populations. Elsewhere there is variation. For example, Tobago (in Trinidad and Tobago) has less inequality than 773 of the sub-national regions. Yet 5.4% of its population are MPI poor, and its MPI value is 0.019. If we look at the Orange Walk region of Belize, which has precisely the same MPI as Tobago, we find that it is about 140 ranks below it in terms of inequality; again, Orange Walk has a pocket of people experiencing very intense poverty, and Tobago does not.

Figure 2: The Relationship between the MPI and Inequality among the Poor across Countries



TRENDS IN INEQUALITY (V^I) AMONG THE POOR OVER TIME

It is important to understand whether a reduction in poverty has left the poorest (who are experiencing the highest intensities of poverty) behind. We evaluate the changes in inequality among the poor measured by V^I over time for 34 countries using comparable datasets compiled by Alkire, Roche and Vaz (2014). The largest absolute reductions in inequality among the poor have occurred in Cambodia, Rwanda, the Dominican Republic and Haiti, followed by Bolivia, Nepal, Ghana and Zambia. The largest reductions in relative inequality among the poor were achieved by the Dominican Republic, Bolivia, Cambodia, and Rwanda, followed by Egypt, Colombia and Indonesia.

As an example, we briefly analyse the success story of Haiti between 2005/06 and 2012. Haiti reduced MPI, H and A statistically significantly, and also significantly reduced V^I. In order to provide a clearer picture, we present the distribution of intensities among the poor using two bar charts: one for 2005/06 and one for 2012. The number of poor people was already lower in 2012, and the shorter bars to the right of the 2012 chart show that the proportion of multidimensionally poor people who were deprived in 80% or more of the weighted indicators has diminished, driving the reduction in inequality.

HORIZONTAL INEQUALITY - DISPARITY IN MPI POVERTY ACROSS SUB-NATIONAL REGIONS (V^D)

Our measure to assess disparity in MPI values between subnational regions (V^D) is the variance of the MPI scores

of each region, normalized between zero and one.³ The same level of national poverty and the same level of inequality among the poor can hide large disparities across different population subgroups, such as across sub-national regions or across various social and ethnic groups. Furthermore, the analysis of subgroup disparity over time measured using (V^D) may be used to understand whether the overall reduction in poverty has been uniformly shared by different population subgroups, or horizontal inequalities have worsened.

Table 2 presents two pair-wise comparisons. The first two countries, India and Yemen, have the same levels of MPI poverty. The incidences and the intensities of poverty are also similar, but inequality among the poor is significantly higher in Yemen than in India. In terms of sub-national regions, Yemen has 21 sub-national regions and India has 29. We find that, as with the national MPIs, the disparities in MPIs across sub-national regions are similar. This means that the inequality in Yemen is not primarily due to regional disparities in poverty levels, but may reflect non-geographic divides, such as cultural or rural-urban.

Togo and Bangladesh tell a different story. As before, the MPIs, incidences, and intensities are quite similar across the two countries. In this case, however, inequality among the poor is very similar, but the regional disparities (V^D) are starkly different. Even though both countries have a similar number of sub-national regions, the level of sub-national disparity (horizontal inequality) is much higher in Togo than in Bangladesh.

Table 1: Comparison between Haiti 2006 and Haiti 2012

	2006	2012	Change
Multidimensional Poverty Index (MPI)	0.335	0.248	-0.087***
Incidence (H)	60.6%	49.4%	-11.2%***
Intensity (A)	55.3%	50.3%	-5.0%***
Inequality among the Poor (V^I)	0.253	0.190	-0.063***

***-Statistically significant at α = 1%

Figure 3: Distribution of Deprivation Scores in Haiti over Time

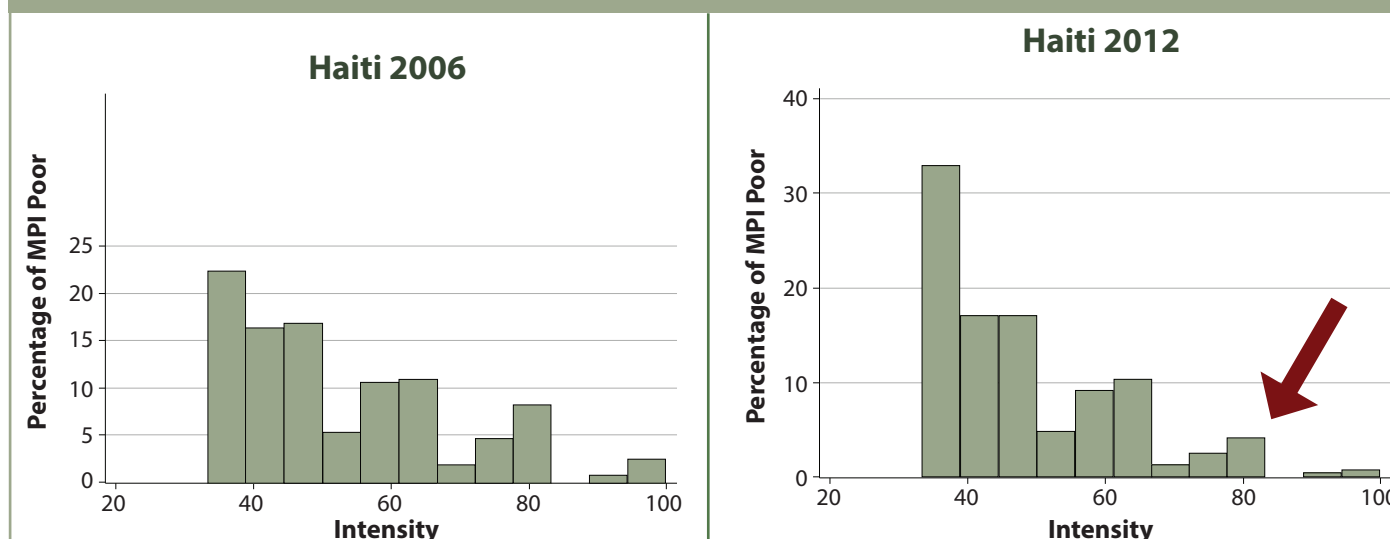


Table 2: Countries with Similar Levels of MPI but Different Levels of Inequality among the Poor and Different Levels of Disparity across Regional MPIs

Country	Year	MPI	A	H	Inequality Among The Poor V^I	Disparity Between MPIs V^D	Number of Regions
Yemen	2006	0.283	53.9%	52.5%	0.274	0.052	21
India	2005	0.283	52.7%	53.7%	0.234	0.050	29
Togo	2010	0.250	50.3%	49.8%	0.194	0.042	6
Bangladesh	2011	0.253	49.5%	51.2%	0.192	0.004	7

Source: Seth and Alkire (2014)

How does V^D change over time? Across 31 countries, the largest absolute reductions in regional disparities occurred in Haiti, Nepal, Kenya and Zimbabwe, followed by Namibia and Gabon. The largest relative reductions in disparity in MPI across regions (V^D) were achieved by the Dominican Republic, Egypt, Nepal and Peru, followed by Colombia, Bolivia, and Haiti. The only country for which the sub-national disparity increased statistically significantly is India.

Figure 4 shows different patterns of changes in disparity across sub-national regions in Egypt and Mozambique. The initial level of MPI is shown on the horizontal axis, and the absolute change in MPI on the vertical axis. The sub-national regions are represented by circles, with the size of the circle denoting the average total population size between the initial and final time periods. It is evident that in Egypt, the regions with higher initial MPI values reduced MPI faster between 2005 and 2008. They caught up. The same cannot be claimed for Mozambique between 2003 and 2011, where the slowest progress of all was made in two of the poorest regions; in other words, horizontal inequalities increased.

Our measure of sub-national disparity based on variance shows a statistically significant reduction in sub-national disparity in Egypt, but no statistically significant change in

Mozambique. Both Mozambique and Egypt reduced MPI, H, and A as well as inequality among the poor statistically significantly at the national level. None of these statistics, however, tell us that regional disparity did not improve across sub-national regions in Mozambique. This shows the importance of considering disparity across subgroups, in addition to measuring MPI poverty, in order to track changes in horizontal inequalities.

CONCLUSION

It is vitally important to consider the distribution of different intensities of poverty among the poor. Our variance (V^I) measure of inequality illuminates pockets of poverty, whether they are in regions of high or low poverty overall. Our variance-based measure of disparity in MPI values across sub-national regions (V^D) shows us at a glance the level of geographic disparities. And analyses over time expose whether horizontal inequalities have increased or decreased, making visible the progress of the poorest subgroups. In this way, using V^I and V^D alongside the Global MPI boosts our understanding of inequality among poor people, and provides insights of great practical value to policymakers; particularly as they determine how best to meet the challenge of eliminating extreme poverty post-2015.

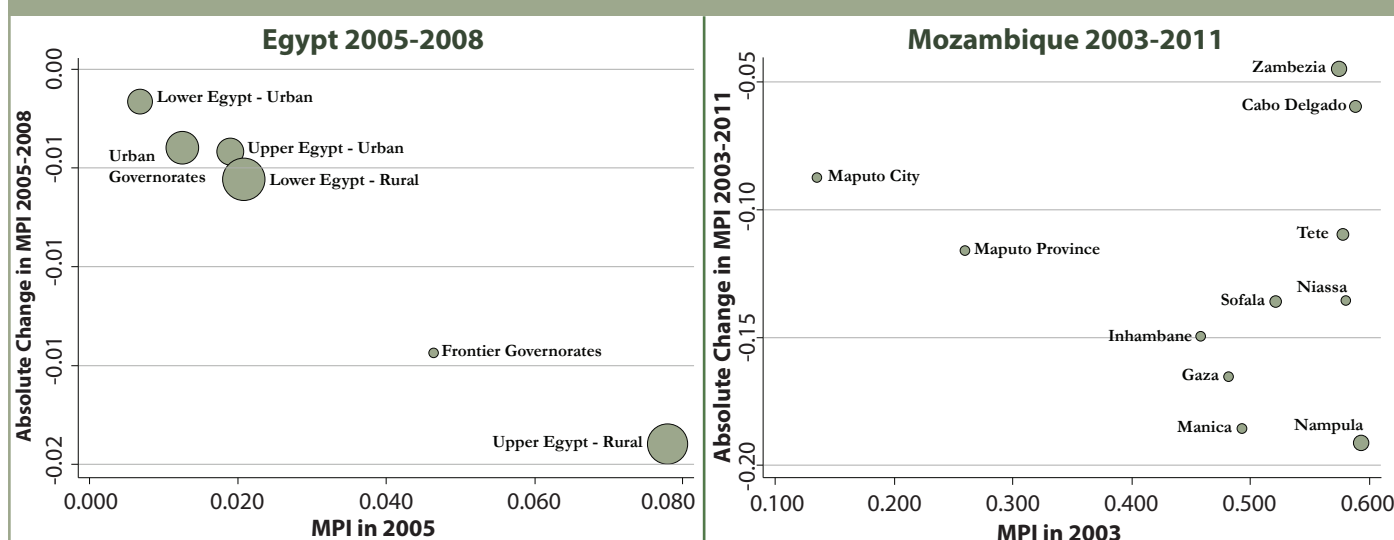
Figure 4: Changes in Disparity in MPIs across Sub-national Regions in Egypt and Mozambique over Time

Table 3: Annualized Absolute Change in MPI, H, A, V^I, and V^D over Time for 34 Countries

Country	Time Period	MPI			H		
		Initial Level	Absolute Annualized Change		Initial Level	Absolute Annualized Change	
Armenia	2005-2010	0.003	0.000	**	0.8%	-0.1%	**
Bangladesh	2004-2011	0.364	-0.017	***	67.1%	-2.5%	***
Benin	2001-2006	0.474	-0.012	***	79.1%	-1.4%	***
Bolivia	2003-2008	0.175	-0.017	***	36.3%	-3.2%	***
Cambodia	2005-2010	0.299	-0.017	***	59.2%	-2.7%	***
Cameroon	2004-2011	0.298	-0.007	***	53.8%	-1.1%	***
Colombia	2005-2010	0.039	-0.003	***	9.0%	-0.7%	***
Dominican Rep.	2002-2007	0.040	-0.004	***	9.3%	-0.8%	***
Egypt	2005-2008	0.034	-0.003	***	8.2%	-0.8%	***
Ethiopia	2000-2011	0.677	-0.014	***	93.6%	-0.8%	***
Gabon	2000-2012	0.161	-0.007	***	35.4%	-1.5%	***
Ghana	2003-2008	0.309	-0.021	***	58.7%	-3.4%	***
Guyana	2005-2009	0.050	-0.002	*	12.7%	-0.5%	*
Haiti	2006-2012	0.335	-0.014	***	60.6%	-1.9%	***
India	1999-2006	0.304	-0.007	***	57.3%	-1.2%	***
Indonesia	2007-2012	0.095	-0.006	***	20.8%	-1.1%	***
Jordan	2007-2009	0.013	-0.001		3.6%	-0.3%	
Kenya	2003-2009	0.296	-0.009	***	60.1%	-1.5%	***
Lesotho	2004-2009	0.238	-0.010	***	50.8%	-1.7%	***
Madagascar	2004-2009	0.374	0.008	***	67.0%	1.3%	***
Malawi	2004-2010	0.381	-0.008	***	72.1%	-0.9%	***
Mozambique	2003-2011	0.505	-0.014	***	82.3%	-1.5%	***
Namibia	2000-2007	0.194	-0.006	***	41.3%	-1.1%	***
Nepal	2006-2011	0.350	-0.027	***	64.7%	-4.1%	***
Niger	2006-2012	0.696	-0.012	***	93.5%	-0.6%	***
Nigeria	2003-2008	0.368	-0.011	***	63.5%	-1.8%	***
Pakistan	2007-2013	0.264	-0.005	***	49.4%	-0.7%	***
Peru	2005-2012	0.085	-0.006	***	19.5%	-1.3%	***
Rwanda	2005-2010	0.461	-0.026	***	82.9%	-3.4%	***
Senegal	2005-2011	0.440	-0.003		71.2%	-0.1%	
Tanzania	2008-2010	0.371	-0.018	***	65.6%	-2.3%	***
Uganda	2006-2011	0.420	-0.015	***	77.9%	-2.2%	***
Zambia	2001-2007	0.397	-0.011	***	72.0%	-1.2%	***
Zimbabwe	2006-2011	0.180	-0.007	***	39.7%	-1.2%	***

***-Statistically significant at $\alpha = 1\%$ | **-Statistically significant at $\alpha = 5\%$, and | *-Statistically significant at $\alpha = 10\%$.

The computed numbers in this table are based on harmonized datasets in order to preserve strict comparability over time and thus may vary from the global MPI figures and the corresponding numbers for inequality among the poor and subnational disparity reported earlier in Figures 1, 2 and 4 and in Table 2.

A			V ^I			V ^D		
Initial Level	Absolute Annualized Change		Initial Level	Absolute Annualized Change		Initial Level	Absolute Annualized Change	
35.4%	-0.1%		0.012	0.001		0.0001	0.0000	***
54.3%	-0.7%	***	0.213	-0.004	***	0.0046	-0.0002	
59.9%	-0.5%	***	0.272	-0.002		0.0434	-0.0001	
48.3%	-0.9%	***	0.146	-0.010	***	0.0112	-0.0011	***
50.5%	-0.9%	***	0.218	-0.013	***	0.0280	-0.0009	
55.3%	-0.2%		0.286	-0.003		0.1483	-0.0010	
42.9%	-0.4%	***	0.122	-0.006	***	0.0037	-0.0004	***
43.1%	-0.7%	***	0.114	-0.012	***	0.0044	-0.0006	***
41.4%	-0.2%		0.083	-0.004	**	0.0031	-0.0005	***
72.3%	-1.0%	***	0.313	-0.003	***	0.0417	-0.0006	**
45.5%	-0.2%	***	0.116	-0.002	***	0.0354	-0.0017	***
52.5%	-0.9%	***	0.227	-0.009	***	0.0590	-0.0012	
39.2%	0.0%		0.055	0.006	**	0.0005	0.0004	**
55.3%	-0.8%	***	0.253	-0.010	***	0.0539	-0.0048	***
53.1%	-0.2%	***	0.227	-0.001		0.0318	0.0013	***
45.9%	-0.6%	***	0.129	-0.006	***	0.0037	0.0000	
35.5%	-0.4%		0.025	-0.006		0.0000	0.0000	
49.3%	-0.3%	*	0.202	-0.005	*	0.0460	-0.0034	***
46.8%	-0.4%	***	0.129	-0.005	***	0.0186	-0.0006	
55.8%	0.1%		0.202	0.004	***	0.0355	-0.0019	
52.8%	-0.4%	***	0.201	-0.006	***	0.0042	-0.0003	**
61.3%	-0.7%	***	0.264	-0.005	***	0.0692	0.0001	
47.1%	-0.2%	*	0.147	-0.003	**	0.0455	-0.0017	***
54.0%	-1.0%	***	0.233	-0.009	***	0.0377	-0.0039	**
74.4%	-0.9%	***	0.297	0.000		0.0521	0.0002	
57.9%	-0.1%		0.328	-0.005	**	0.1169	0.0020	
53.4%	-0.3%	**	0.264	0.000		0.0063	0.0004	
43.7%	-0.4%	**	0.094	-0.003	**	0.0164	-0.0015	***
55.6%	-1.1%	***	0.217	-0.012	***	0.0137	0.0004	
61.8%	-0.4%	*	0.338	-0.005	**	0.1265	-0.0045	*
56.6%	-0.9%	***	0.252	-0.006		0.0169	0.0004	
53.9%	-0.5%	***	0.204	-0.004	**	0.0381	-0.0001	
55.1%	-0.7%	***	0.236	-0.008	***	0.0562	-0.0009	
45.3%	-0.4%	***	0.119	-0.004	***	0.0307	-0.0028	***

Oxford Poverty & Human Development Initiative (OPHI)

Oxford Department of International Development (ODID)
Queen Elizabeth House (QEH)
University of Oxford, Mansfield Road
Oxford OX1 3TB UK

Telephone: +44 (0)1865 271915

Email: ophi@qeh.ox.ac.uk

Website: www.ophi.org.uk

OPHI gratefully acknowledges support from research councils, non-governmental and governmental organisations, and private benefactors. For a list of our funders and donors, please visit our website: www.ophi.org.uk.



NOTES

1. How is V^I computed? The difference between each poor person's deprivation score and average intensity is squared, and the squared differences are added up, then multiplied by $1/9$ to create the measure of inequality. For further discussions, see Seth and Alkire (2014) and Alkire *et al* (2014).
2. Because of the decomposability properties of the Global MPI, it would also be possible to study horizontal inequality across subnational groups defined by ethnic, religious, or other salient categories for which the survey is representative.
3. How is V^D computed? The difference between each region's MPI and the national MPI is squared, and the population-share weighted squared differences are added up, then multiplied by $1/4$ to create the measure of disparity. For further discussions, see Seth and Alkire (2014) and Alkire *et al* (2014).

REFERENCES

Alkire S, Roche, J. M. and Vaz, A. (2014): "Multidimensional Poverty Dynamics: Methodology and Results for 34 Countries", Mimeo.

Alkire S, Conconi, A., and Seth, S. (2014): "Multidimensional Poverty Index 2014: Brief Methodological Note and Results", Oxford Poverty and Human Development Initiative, University of Oxford.

Seth S. and Alkire, S. (2014): "Measuring and Decomposing Inequality among the Multidimensionally Poor Using Ordinal Data: A Counting Approach", OPHI Working Paper No 68, Oxford Poverty and Human Development Initiative, University of Oxford.

Stewart, F. (2010): *Horizontal Inequalities and Conflict*. Palgrave Macmillan.

Photo by Vanita Leah Falcao/OPHI