Technical Appendix

Option 1 – Mozambique Poverty Profile

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Hypothesis Tests: The How

In order to get a clearer answer to the question "Who Are the Poor in Mozambique?," we applied rigorous hypothesis tests to the 2014-2015 Mozambique Household Budget Survey (Inquérito Sobre Orçamento Familiar). All hypothesis tests used a standard significance level (α) of 0.05.

A large majority of the variables provided could be ranked on a binary "Yes/No" scale. With these variables, we tested the difference in proportions between the poor and not poor. For some non-binary variables, such as "Sanitation Type," we judged a "Good" or "Bad" Sanitation facility with a relative, value-based judgement based in preliminary research. We utilized Household-level data for household based qualifiers. For example, all members with the same household ID have the same "Flooring Type". For individual variables, such as Disability and Age, we used individual data.

Hypothesis: Difference in Proportions; Rural/Urban Poor

Geography	*Number of Poor Households*	*Proportion of Poor Households in Mozambique*	*SE*	*T-Score*	*P-Value*
Rural	696	0.62254	0.0142	9.169	0.000
Urban	422	0.37746			
Total	1118	1			

Hypothesis: Chi-Squared Test for Observed Consump. Per Quintile

Consumption Quintile	*Total Households*	*Observed Consumption by Quintile*	*Expected Consumption by Quintile*[1]	*Chi-Squared*
1st Quintile (Lowest)	427	26,689.21	139,158.00	90,897.99
2nd Quintile	455	46,549.88	151,542.00	72,741.00
3rd Quintile	409	60,749.83	133,292.00	39,480.00
4th Quintile	447	93,705.48	145,676.00	18,540.00
5th Quintile	778	595,519.30	253,547.00	461,235.00
Total	2526	823213.70	823213.70	**682,894**

Chi Square: 682,894
Degrees of Freedom: 4
P-Value: $p < 0.01$

[1] Assuming equal consumption across each household. This value is weighted appropriately for the count of households in each quintile.

Hypothesis: Chi-Squared Test for Type of Education in Poor Households

Education Category	*Observed Counts of Poor Heads of Household In Education Category*	*Expected Counts in Education Category*[2]	*Chi-Squared*
No Education	411	299.810	41.237
LowerPrimary	445	387.495	8.534
Upper Primary	121	154.998	7.457
Lower Secondary	73	125.770	22.141
Upper Secondary	30	65.985	19.624
Adult Education	22	19.043	0.459
University /Technical School	10	58.899	40.597
Total	1112	1112	**140.049**

Chi Square: 140.049
P-Value: $p < 0.0001$
Degrees of freedom: 6

[2] Standardized to the distribution of overall level of education in the sample.

Hypothesis: Gini Coefficient of Inequality, Using Consumption Quintiles[3]

$$Gini\ Coefficient = 1 - \sum^{all}(PP + 2HC) * CP$$

PP[4]	$\frac{Observed\ Consumption}{Total\ Households}$
HC[5]	$1 - Cumulative\ PP$
CP[6]	$\frac{Obsvered\ Consumption\ by\ Quintile}{Total\ Consumption}$

Consumption Quintile	*Total Households*	*Observed Consumption by Quintile*	*Proportion of Population (PP)*	*Proportion of Total Consumption by Quintile (CP)*	*Proportion of Population with Higher Consumption (HC)*	*Summation Score*[7]
1st Quintile (Lowest)	427	26,689.21	0.17	0.03	0.83	0.06
2nd Quintile	455	46,549.88	0.18	0.06	0.65	0.08
3rd Quintile	409	60,749.83	0.16	0.07	0.49	0.08
4th Quintile	447	93,705.48	0.18	0.11	0.31	0.09
5th Quintile (Highest)	778	595,519.30	0.31	0.72	0	0.22
Total	2526	823213.70	1	1	1	**0.54**

$$Gini\ Coefficient = 1 - 0.54$$
$$\boldsymbol{Gini\ Coefficient = 0.46}$$

[3] The equation for calculating the Gini coefficient comes from a public presentation from Notre Dame economics professor, Wyatt Brooks. Access at: https://www3.nd.edu/~wbrooks/GiniNotes.pdf

[4] Proportion of Population by Quintile

[5] Proportion of Population with Higher Consumption

[6] Proportion of Total Consumption by Quintile

[7] $\sum^{all}(PP + 2HC) * CP$

Subject	*Household or Individual*	*Variable Considered*	*Type of Hypothesis Test*	*Null Hypothesis*	*Standard Error*	*Z/T-Score*	*P-Value*	*Conclusion*
Access to Transportation[8]	Individual	motorcycles, car_used, car_new, bicycle, time_facitlity_c	Difference in Proportions	No difference in proportions between Poor (P) and Not Poor (NP)	0.079	3.053	0.0022	Reject Ho
Education - Adult Literacy[9]	Individual - Ages <16	Can read and write	Difference in Proportion	P and NP adults are equally likely to have the ability to read and write	0.01864	24.99	<0.0001	Reject Ho
Internet Access[10]	Household	used_interne~12	Difference in Proportion	P and NP people are equally likely to lack functional access to the internet	0.006	43.25	<0.0001	Reject Ho
Location (Urban/Rural)	Household	location	Difference in Proportion	Rural and Urban HH are equally likely to be poor.	0.0191	13.122	<0.0001	Reject Ho
Number of Children (>14)	Household	number_of_children_under_14	Difference in Means	P and NP HH have the same average number of children >age 14	0.073	17.057	<0.0001	Reject Ho
Quality of Residence (Roof[11])	Household	roof_type	Difference in Proportion	P and NP HH are equally likely to have a good roof.	0.112	-3.702	0.0002	Reject Ho
Sanitation[12]	Household	sanitation_type	Difference in Proportion	P and NP people are equally likely to have no access to sanitation/ poor	0.0075	33.54	<0.0001	Reject Ho

[8] "Access" defined by access to used or new car, a bicycle or being less than 60 minutes away from a bus stop

[9] Classifying adults as older than 16; Children as younger than 16.

[10] "Access" as functional access for at least one household member

[11] Good roof is NOT is grass/stem/wood

[12] "Sanitation" as any sanitation system. Compared with No Sanitation Facility