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CONSUMPTION EXPENDITURE PATTERN OF RURAL AND URBAN HOUSEHOLDS IN NAMIBIA: A QUANTILE REGRESSION APPROACH

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INTRODUCTION

- ❖ Consumption is final purchase of goods and services
- ❖ National income is important variable to model consumption pattern
- ❖ In Namibia, at the national level (NHIES 2009/2010):
 - ❖ Total consumption in cash: 73 %
 - ❖ Total consumption in kind: 27 %
 - ❖ Urban area consumption > 3 times the rural area consumption

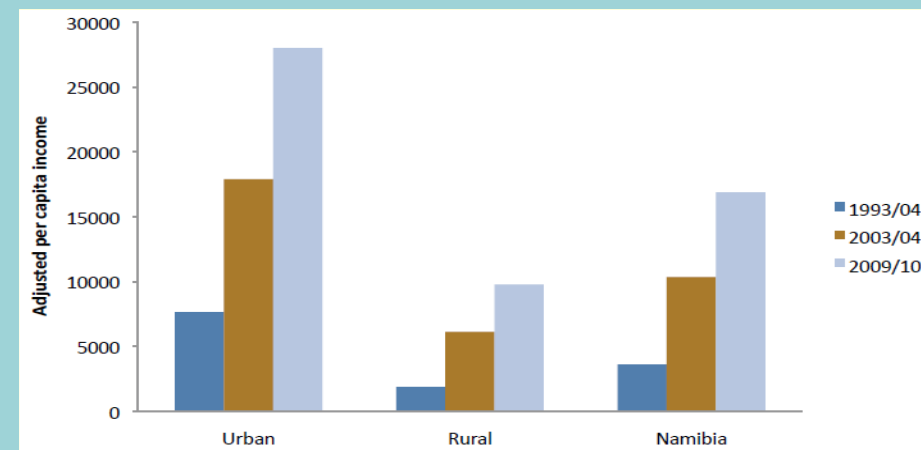


Figure 1. Annual adjusted per capita income (in N\$) by urban/rural areas (Source: NHIES 2009/10)

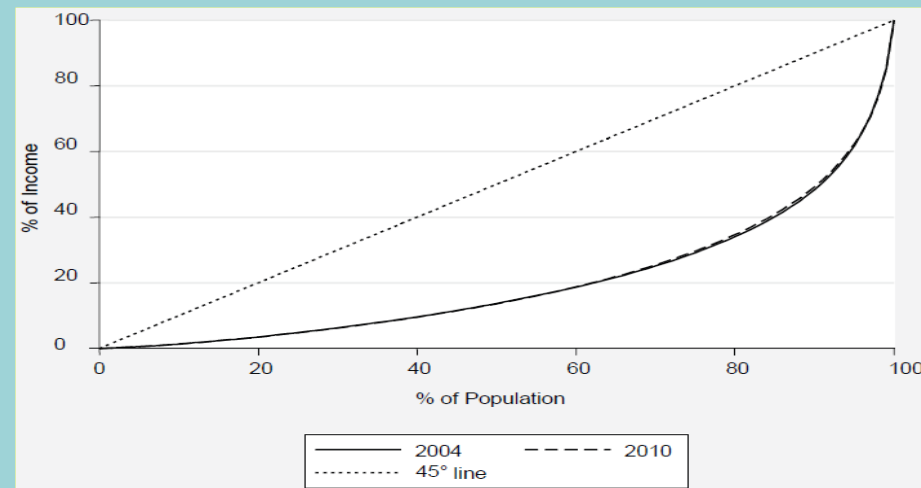


Figure 2. Lorenz diagram for income distribution among the population in Namibia, 2009/10 (Source: NHIES 2009/10)

- ❖ Consumption pattern study in Rural and Urban areas has interesting implications to policy and literature

CONCEPTUAL FRAMEWORK

- ❖ Household consumption patterns depend on different socio economic factors
- ❖ Household chooses optimal combination of goods to maximize its utility subjecting to budget constraint
- ❖ In general, consumption is function of income.

DATA

- ❖ Namibia household income and expenditure survey 2009/10 (world bank survey data)

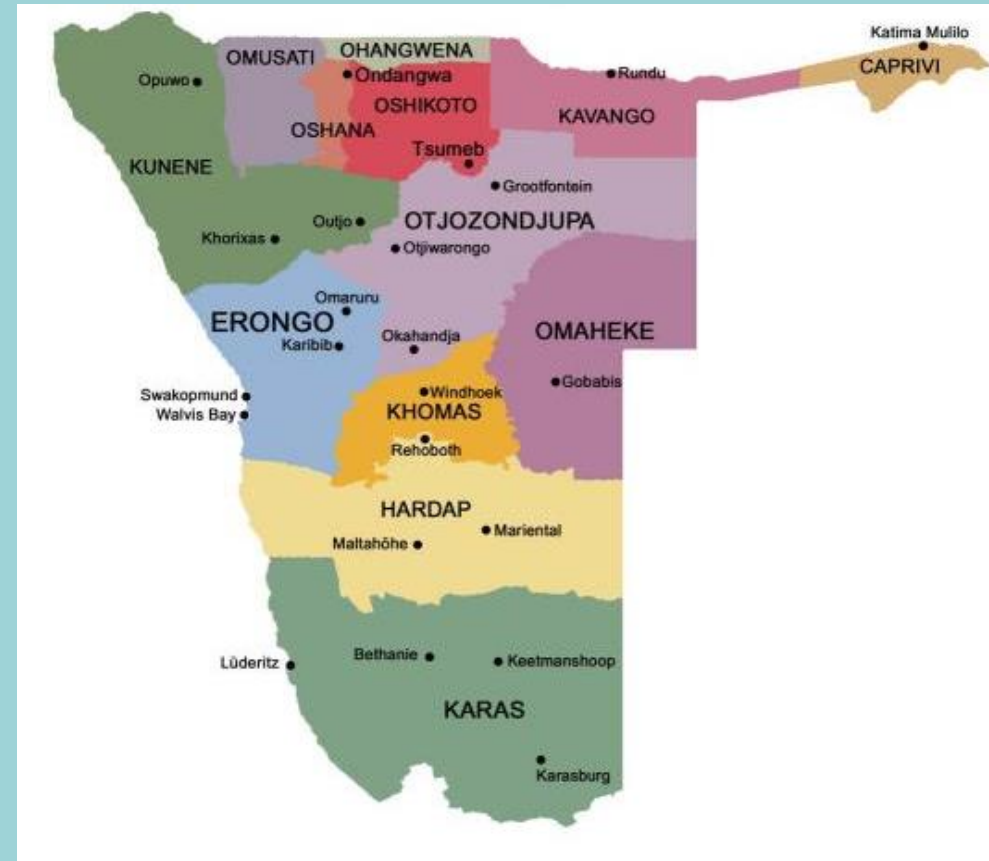


Figure 3. Map of Namibia (Source: www.africanhealthleadership.org)

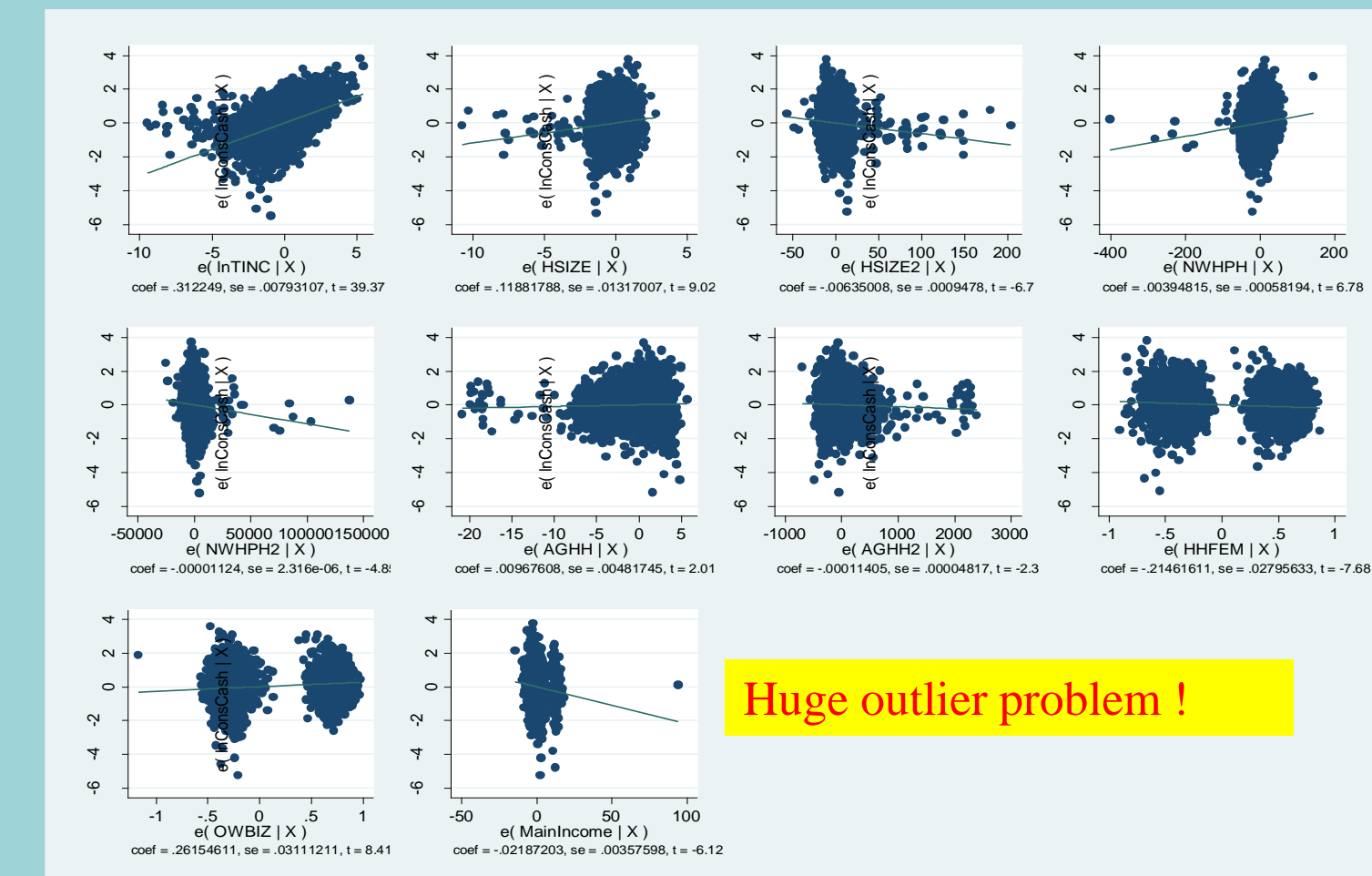
EMPIRICAL MODELS

Empirical specification of consumption: General Model
 $\log(C) = \beta_1 + \beta_2 \log(X_1) + \beta_3 X_2 + \beta_4 X_3 + \beta_5 X_4 + \beta_6 X_5 + \beta_7 X_6 + \beta_8 X_7 + \beta_9 D_1 + \beta_{10} D_2 + \beta_{11} D_3$
 Where,
 $\log(C)$ = Logarithm of household annual consumption
 $\log(X_1)$ = Logarithm of total annual income
 X_2 = Household size
 X_3 = Square of household size
 X_4 = Number of hours worked per household
 X_5 = Square of number of hours worked per household
 X_6 = Age of head of household
 X_7 = Square of age of head of household
 D_1 = Dummy variable if head of household is female
 D_2 = Dummy variable if household having own business
 D_3 = Dummy variable if household main source of income is farming

(TOTAL OF FOUR MODELS: TWO FOR EACH REGIONS)

Analysis of MLR Assumptions	Test	Results
Assumption 1: Linear in Parameters		Here the stated model has linear parameters.
Assumption 2: Random Sampling		We have a random sample of 9656 observations
Assumption 3: No-Perfect Collinearity	VIF	Mean VIF = 8.06 (No Multicollinearity problem because VIF < 10 even if using three square terms)
Assumption 4: Homoskedasticity	Breusch Pagan test	chi2(1) = 159.26 Prob > chi2 = 0.0000 Huge Heteroskedasticity problem
Assumption 5: Autocorrelation		Not needed
Analysis for Assumption 6: Normality	Kernel Density Estimate	

AVPLOTS To Test Outliers



ESTIMATION METHODS

Reasons behind choosing Quantile Regression over OLS:

- ❖ Quantile regression is more robust against outliers than OLS
- ❖ Quantile regression allows to get different rate of change of consumption
- ❖ OLS in this case will give incomplete scenario of the consumption distribution
- ❖ Quantile regression is flexible for modeling data with heterogeneous conditional distribution.
- ❖ Extends the regression model to conditional quantiles of a response variables (we have 5th, 25th, 50th, 75th & 95th)

EMPIRICAL RESULTS

QUANTILE AND OLS REGRESSION COEFFICIENTS FOR HOUSEHOLD CASH AND KIND CONSUMPTION

Variables	5 th percentile		25 th percentile		50 th percentile		75 th percentile		95 th percentile		
	Cash	Kind	Cash	Kind	Cash	Kind	Cash	Kind	Cash	Kind	
Rural	lnTINC	0.592**	-0.083**	0.556**	0.035**	0.519**	0.109**	0.475**	0.171**	0.453**	0.265**
	HSIZE	0.101**	0.163**	0.107**	0.164**	0.093**	0.150**	0.080**	0.117**	0.048**	0.087**
	HSIZE2	-0.002**	-0.004	-0.004**	-0.005**	-0.003**	-0.005**	-0.003**	-0.003**	-0.001	-0.002**
	NWHPH	0.002**	-0.003**	0.002**	-0.003**	0.002**	-0.002**	0.003**	-0.001	0.004**	0.000
	NWHPH2	-0.000	0.000	-0.000**	-0.000**	-0.000	-0.000**	0.000	-0.000**	0.000	-0.000**
	AGHH	-0.011	-0.003	-0.002	0.013**	0.001	0.012**	0.011*	0.009**	0.027**	-0.000
	AGHH2	0.000	0.000	-0.000	-0.000	-0.000	-0.000	-0.000**	-0.000	-0.000**	0.000
	HHFEM	0.226**	0.027	0.067**	-0.009	0.007	-0.003	-0.065*	-0.021	-0.263**	-0.066*
	OWBIZ	0.563**	0.024	0.511**	-0.021	0.494**	0.015	0.453**	-0.009	0.307**	0.004
	MainIncome	-0.042**	-0.005	-0.024**	-0.018**	-0.025**	-0.015**	-0.029**	-0.012**	-0.020*	-0.005
Urban	lnTINC	0.472**	-0.009	0.354**	0.230**	0.333**	0.381**	0.296**	0.443**	0.239**	0.529**
	HSIZE	0.118**	0.083*	0.122**	0.336**	0.113**	0.165**	0.114**	0.106**	0.026	0.001
	HSIZE2	-0.006**	0.005	-0.006**	-0.015**	-0.006**	-0.008**	-0.007**	-0.005**	-0.002	0.001
	NWHPH	0.003**	-0.002	0.004**	-0.002	0.002**	-0.001	0.004**	-0.001	0.005**	0.000
	NWHPH2	-0.000**	0.000	-0.000**	-0.000**	-0.000**	0.000	-0.000**	0.000**	-0.000**	-0.000
	AGHH	-0.002	-0.022	0.007	0.071**	0.013	0.061**	0.011	0.044**	0.035**	0.014
	AGHH2	-0.000	0.000*	-0.000**	-0.000**	-0.000	-0.000**	-0.000	-0.000**	-0.000**	-0.000
	HHFEM	-0.077	0.057	-0.109**	0.069	-0.214**	0.011	-0.311**	-0.077	-0.332**	-0.201**
	OWBIZ	0.252**	-0.044	0.248**	0.170*	0.286**	0.088**	0.306**	0.100**	0.295**	0.070
	MainIncome	-0.027**	0.085**	-0.026**	0.033**	-0.023**	0.022**	-0.013**	0.009**	-0.006	0.013*
OLS	RURAL		URBAN								
	Cash	Kind	Cash	Kind							
	lnTINC	0.513**	0.093**	0.321**	0.322**						
	HSIZE	0.093**	0.138**	0.119**	0.208**						
	HSIZE2	-0.003**	-0.004**	-0.006**	-0.009**						
	NWHPH	0.002**	-0.001**	0.004**	0.001						
	NWHPH2	-0.000**	0.000	-0.000**	0.000						
	AGHH	0.006	0.010**	0.010**	0.054**						
	AGHH2	-0.00**	0.000	-0.000**	-0.000**						
	HHFEM	-0.010	-0.030	-0.215**	0.013						
OWBIZ	0.410**	0.027	0.262**	0.148**							
MainIncome	-0.030**	-0.008**	-0.022**	0.031**							

Variables	QUANTILE REGRESSION COEFFICIENTS SIGNS										OLS				
	Rural					Urban					Rural		Urban		
	5 th	25 th	50 th	75 th	95 th	5 th	25 th	50 th	75 th	95 th	C	K	C	K	
lnTINC	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+
HSIZE	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
HSIZE2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NWHPH	+	+	-	+	+	+	-	+	-	+	+	+	+	+	+
NWHPH2	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-
AGHH	-	-	+	+	+	+	+	+	+	+	+	+	+	+	+
AGHH2	+	+	-	-	-	-	+	-	-	-	-	-	-	-	-
HHFEM	+	+	+	-	-	-	-	+	-	-	-	-	-	-	+
OWBIZ	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
MainIncome	-	-	-	-	-	-	+	+	+	+	-	-	-	-	+

RESULTS FOR RURAL AREA

- ❖ 1% increase in household total income
 - ❖ ↑ household cash consumption by 0.59% (5th), 0.56% (25th), 0.52% (50th), 0.48% (75th) and 0.43% (95th)
 - ❖ ↑ household kind consumption by 0.04% (25th), 0.11% (50th), 0.17% (75th) and 0.27% (95th) but 1.1% (5th)
- ❖ Rural household with farming as MSI will have significantly lower cash consumption by 0.042% (5th), 0.023% (25th), 0.024% (50th), 0.029% (75th) and 0.02% (95th) than HH WITH OTHER MSI.
- ❖ Rural household with farming as MSI will have significantly lower kind consumption by 0.005% (5th), 0.018% (25th), 0.0146% (50th), 0.0137% (75th) and 0.0045% (95th) than HH WITH OTHER MSI.

RESULTS FOR URBAN AREA

- ❖ 1% increase in household total income
 - ❖ ↑ household cash consumption by 0.47% (5th), 0.35% (25th), 0.33% (50th), 0.29% (75th) and 0.24% (95th)
 - ❖ ↑ household kind consumption by 0.23% (25th), 0.38% (50th), 0.44% (75th) and 0.27% (95th) and by 0.24% (5th)
- ❖ Urban household with farming as MSI will have significantly lower cash consumption by 0.027% (5th), 0.026% (25th), 0.02% (50th) and 0.01% (75th) than HH WITH OTHER MSI.
- ❖ Urban household with farming as MSI will have significantly higher kind consumption by 0.085% (5th), 0.033% (25th), 0.022% (50th), 0.0092% (75th) and 0.013% (95th) than HH WITH OTHER MSI.

CONCLUSIONS

- ❖ HH total income and MSI in Namibia are key explanatory variables
- ❖ HH with own business have higher cash consumption in both rural and urban area of Namibia.
- ❖ For same % increase in HH income in Namibia:
 - ❖ Rural HHs will have higher cash consumption than urban households in all quantiles.
 - ❖ Urban HHs will have higher in kind consumption than rural HHs in all studied quantiles(except at 5th)
 - ❖ Rural HHs having farming as MSI will have less cash consumption than Rural HH with OTHER MSI. However, the result is opposite in Case of Urban HHs

IMPLICATIONS

- ❖ Explicit image of rural and urban HHs consumption pattern of Namibia.
- ❖ Helpful to implement any future activities related to HH consumption.
 - ❖ There is higher possibility to increase the total consumption of both rural and urban HHs by increasing per capita income, strengthening people to build up their own business and reducing rural and urban inequity of income distribution.

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