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Migration, Income Pooling and Food Deprivation

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Context

1. **Migration a significant feature of the 21st century**
   Household members are spatially dispersed, creating household of origin (those left behind) and migrant household.

2. **Technology on the rise**
   Geographically dispersed household members able to maintain close relation and share decisions almost on daily bases to create collective welfare.

Economic approaches

1. **Economists have traditionally treated each household as independent**
   Co-residence and eating from the same pot (food budget) remains a defining feature of the household.

As a result

- ❖ *Households models developed to date do not cater for this spatial dimension*
- ❖ *Interdependency of households is underplayed*
- ❖ *Remittances are not integrated to the income constraints of the household at origin*

2. **Income pooling has only been studied in the context of independent households**
   If household consumption is independent of who brings money into the household (<u>because the expenditure outcome is the same</u>), then income is pooled.

Versus

- ❖ *Unitary household model = income pooling*
- ❖ *Collective household models ≠ income pooling*

This paper

1. Models geographically stretched households (GSH)
2. Provides testable empirical and policy implications of the model
3. Puts to test the implications of the model based on data collected from the second largest city in Zimbabwe

In particular

- *Establishes the determinates of migrant remittances*
- *It deviates from the norm by testing for income pooling between migrants' remittances and income generated at the household of origin*
- *Examines the impact of migration on the household of origin in the context of food deprivation*

The GSH model

The household utility function can be formally represented as:

$$U = u(C_d, C_s, C_h) \text{ where the restrictions } u' > 0, \quad u'' < 0 \text{ apply}$$

Subject to the GSH income constraint:

$$(1-\delta)\sum_{i=d,s,h} p_i C_i = p_h T(1-m) + p_s Q(K, L, V) - p_l L - p_v V + \gamma p_m m T$$

Where:

- $1-\delta$ captures the reduction in the total household expenditure on the three consumption items C_d, C_s and C_h after migration has taken place;
- The proportion of household labour in migration is represented by m and $1-m$ captures the reduction in total stock of household time after migration has taken place;
- The remittance into the household of origin is represented by $\gamma m T p_m$;
- The parameter γ also determines the inter-connection of the migrant and those left behind and has the restriction $0 \leq \gamma < 1$.

The GSH model

The solution of the Lagrange consists of the following first-order conditions:

$$U_i' = (1-\delta)\boldsymbol{\lambda} p_i,\ i=\{d,s,h\},$$

$$p_j Q_j' = p_j,,\ i=\{l,v\}$$

$$(1-\delta)\sum_{i=d,s,h} p_i C_i = p_h T(1-m) + p_s Q(K,L,V) - p_l L - p_v V + \gamma p_m m T$$

The first two solutions of the GSH maximisation problem are consistent with the economic theories of the consumer and producer respectively, i.e.

Consumer theory stipulates that $\frac{U_{C_d}'}{U_{C_s}'} = \frac{p_d}{p_s}$ and producer theory stipulates that the standard maximisation for conventional firms equates marginal revenue product of inputs to their price.

The last solution provides the full income of the GSH (Y_{gsh}) ex-post migration.

Implications of the GSH model

1. **Testable implication:** Household has higher income ex-post migration to mitigate food deprivation.

Falsifiable conditions

- Migrants must be remitting *(who is most likely to remit to members left behind – determinates of remitting)*.
- Remittances must be used to maximise the welfare of the members at the household of origin *(expenditure outcome resulting from remittances to be the same as income at origin – income pooling)*

2. **Social policy implication:** A blanket social policy that excludes migrant households from social assistance may be prejudiced.

3. **Migration policy implication:** $\frac{\partial m}{\partial p_h} < 0$ and $\frac{\partial m}{\partial \pi} < 0$

Therefore

- Policy that does not take thorough cognisance of migration and migrants at household of origin may not be able to capture the wider social and economic context of households and their welfare.

Data and descriptive statistics

Structure of the Sample

Classification	LOCATION			
	Matshobana	Sizinda	Sokusile	Total
Households	98	100	100	298
Migrants	233	192	120	545
Households with self-production	11	15	24	50
Relation to head: Nuclear family*	427	339	375	1141
Relation to head: Extended family**	245	167	134	546
Relation to head: Other***	18	23	52	93

Data and descriptive statistics

Household Descriptive Statistics

Classification	Household with Migrants	Household without Migrants	t-test for difference in means
Household size (excluding migrated members)	5.18	4.83	$p < 0.05$
	(3.36)	(3.31)	
Monthly wage	$174.25	$221.60	$p < 0.01$
	(224.78)	(254.82)	
Monthly consumption	$200.01	$201.71	$p > 0.10$
	(87.77)	(88.24)	
Entrepreneurial income	$17.22	$19.84	$p > 0.10$
	(91.39)	(96.05)	
Food deprivation* (=1 if yes)	0.81	0.85	$p < 0.05$
	(0.29)	(0.21)	
N	226	72	

Data and descriptive statistics

Migrant Descriptive Statistics

Send cash and non-cash remittances		46.5%
Send cash remittances only		40.5%
Send non-cash remittances only		10.5%
Monthly cash remittances*		$127.93 ($278.86)
Monthly non-cash remittances*		$93.22 ($184.22)
Gender (male/female)**		0.807
Child in migrant-sending household (yes/no)		0.504
Education level:	Did not complete secondary	17.26%
	Completed secondary	62.70%
	Completed college/university	20.04%
Type of job:	General (unskilled worker tasked with a variety of jobs)	36.75%
	Skilled with accredited certificate	33.33%
	Other (not belonging to the above two categories)	29.91%
Destination of migrants:	Elsewhere in Zimbabwe	39.75%
	South Africa	53.83%
	Other neighbouring countries	3.92%
	West	2.49%

Determinants of remitting

Questions asked:

Did the migrant send money in the past year? Did the migrant send non-cash remittances?

Coded ‘1’ if the migrant sent remittances and ‘0’ if the migrant did not.

Empirical implementation

$$p(send = 1|migrant\ characteristics) = G(z) = \exp(z)\ /[1 + \exp(z)]$$

Dependent variable is Remit (= 1 if yes and = 0 if no)	**Full Model:** *All Migrants*		**Restricted Model (a):** *Migrants Within Zimbabwe*		**Restricted Model (b):** *Migrants Outside Zimbabwe*	
VARIABLES	(1) Remit cash	(2) Remit goods	(3) Remit cash	(4) Remit goods	(5) Remit cash	(6) Remit goods
Residence of migrant: South Africa	0.849**	0.673				
	(0.332)	(0.427)				
Residence of migrant: Other neighbouring countries	1.141*	1.141				
	(0.626)	(0.715)				
Residence of migrant: West	1.583	-0.860				
	(1.051)	(0.988)				
Household size	-0.025	0.096**	0.086	0.240**	-0.040	0.071
	(0.039)	(0.042)	(0.081)	(0.102)	(0.043)	(0.046)
Total Income at Household of origin	6.39e-05	0.0003	0.0005	-0.001	-7.57e-05	3.18e-05
	(0.0005)	(0.0005)	(0.0009)	(0.001)	(0.0007)	(0.0006)
Migrant age	0.244***	0.050	0.459***	-0.017	0.159**	0.119
	(0.068)	(0.067)	(0.131)	(0.128)	(0.075)	(0.107)
Migrant age squared	-0.003***	-0.0004	-0.006***	-4.22e-05	-0.002**	-0.001
	(0.0008)	(0.0008)	(0.001)	(0.001)	(0.0009)	(0.001)
Relation to head: Nuclear family	-0.600	0.231	0.885	-0.928	-2.323	0.592
	(0.651)	(0.665)	(1.075)	(1.697)	(1.418)	(0.728)
Relation to head: Extended family	-1.164*	-0.136	0.392	0.694	-3.060**	0.080
	(0.660)	(0.718)	(1.078)	(1.427)	(1.434)	(0.767)
Relation to head: Other	-0.471	1.312			-2.259	2.033*
	(0.965)	(0.984)			(1.641)	(1.083)
Male (= 1)	-0.227	0.185	0.242	0.551	-0.359	0.008
	(0.267)	(0.304)	(0.592)	(0.805)	(0.294)	(0.322)
Education: Completed Secondary	0.564	1.609***	0.085	2.971**	0.798	1.139*
	(0.423)	(0.593)	(0.837)	(1.421)	(0.519)	(0.673)
Education: Completed College/University	1.799***	2.122***	1.494	2.600*	1.589**	1.857**
	(0.526)	(0.675)	(0.986)	(1.486)	(0.663)	(0.798)
Type of job: Skilled with accredited certificate	0.202	0.367	0.303	20.02***	0.307	0.118
	(0.332)	(0.369)	(0.738)	(4.512)	(0.370)	(0.419)
Type of job: Other	-0.796**	0.081	-0.578	19.77***	-1.027**	-0.147
	(0.361)	(0.480)	(0.646)	(4.501)	(0.484)	(0.547)
Has a child in household of origin (= 1)	1.529***	1.218***	0.921*	1.381	1.731***	1.180***
	(0.275)	(0.323)	(0.553)	(0.998)	(0.315)	(0.347)
Neighbourhood: Sokusile	0.478	1.553***	1.574*	2.483*	-0.001	1.420***
	(0.356)	(0.391)	(0.808)	(1.336)	(0.363)	(0.385)
Neighbourhood: Sizinda	-0.0453	-0.035	0.556	0.845	-0.387	-0.409
	(0.293)	(0.397)	(0.550)	(0.893)	(0.393)	(0.504)
Constant	-4.933***	-6.614***	-12.05***	-26.03	-0.553	-6.468***
	(1.482)	(1.665)	(3.274)	(0)	(1.804)	(2.030)
Observations	431	380	156	129	299	267
Pseudo R-squared	0.27	0.22	0.33	0.23	0.21	0.19

Income pooling

Use of remittances

Intention is to see if expenditure outcomes, at the household of origin, are the same for remittances as well as income of the household at origin – income pooling.

Testable estimation procedure for income pooling

$$\frac{\partial E_z}{\partial Y_m^i} = \frac{\partial E_z}{\partial Y_h};$$

where z indexes expenditure categories being examined in the reference household, i.e. sustenance consumption, clothing and education.

Econometric model consistent with the estimation above is

$$E_{zh} = \alpha_{0,zh} + \vartheta_{1,zh} Y_m^i + \vartheta_{2,zh} Y_h + \vartheta_{3,zh} \boldsymbol{D}_h + \boldsymbol{\varepsilon_{ih}}$$

Income pooling

Expenditures	All Migrants (1)	Migrant without children Male (2)	Migrant without children Female (3)	Migrant with children Male (4)	Migrant with children Female (5)	Gendered Male (6)	Gendered Female (7)
Sustenance Consumption	F(1, 206) = 3.01 Prob > F = 0.0845* [224 obs]	F(1, 33) = 5.07 Prob > F = 0.0311** [49 obs]	F(1, 52) = 3.54 Prob > F = 0.0655* [69 obs]	F(1, 25) = 14.4 Prob > F = 0.0006*** [42 obs]	F(1, 47) = 0.03 Prob > F = 0.8740 [64 obs]	F(1, 73) = 3.74 Prob > F = 0.0571* [91 obs]	F(1, 113) = 0.16 Prob > F = 0.6893 [131 obs]
Clothing	F(1, 206) = 0.00 Prob > F = 0.9755 [224 obs]	F(1, 33) = 0.01 Prob > F = 0.9202 [49 obs]	F(1, 52) = 1.93 Prob > F = 0.1702 [69 obs]	F(1, 25) = 0.70 Prob > F = 0.4119 [42 obs]	F(1, 47) = 2.16 Prob > F = 0.1485 [64 obs]	F(1, 73) = 0.06 Prob > F = 0.8011 [91 obs]	F(1, 113) = 0.01 Prob > F = 0.9178 [131 obs]
Education	F(1, 185) = 1.81 Prob > F = 0.1805 [203 obs]	F(1, 32) = 0.00 Prob > F = 0.9708 [48 obs]	F(1, 42) = 0.20 Prob > F = 0.6572 [59 obs]	F(1, 21) = 0.75 Prob > F = 0.3954 [38 obs]	F(1, 41) = 0.00 Prob > F = 0.9909 [58 obs]	F(1, 68) = 0.58 Prob > F = 0.4491 [86 obs]	F(1, 97) = 0.55 Prob > F = 0.4591 [115 obs]

Income pooling

Income Pooling with Estimate Restricted to Migrants within Zimbabwe

	Sustenance Consumption		**Clothing**		**Education**	
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	All migrants	All female migrants	All migrants	All female migrants	All migrants	All female migrants
Test of income pooling	F(1, 37) = 1.85 Prob > F = 0.1819	F(1, 19) = 1.71 Prob > F = 0.2061	F(1, 37) = 0.47 Prob > F = 0.4988	F(1, 19) = 0.47 Prob > F = 0.3404	F(1, 35) = 0.16 Prob > F = 0.6940	F(1, 37) = 0.17 Prob > F = 0.6861
Observations	51	33	51	33	49	31

Impact of migration on food deprivation

Issues

Direction of causality between migration and food deprivation and selection bias.

Maximum likelihood estimation of endogenous switching regression

$$fd_{1i} = \beta_1 X_i + \epsilon_1, \text{ when } (m_i = 1)$$

$$fd_{0i} = \beta_0 X_i + \epsilon_0, \text{ when } (m_i = 0)$$

$$I_i^* = \alpha(fd_{1i} - fd_{0i}) + cZ_i + \mu_i$$

I_i, which is a latent variable that determines the migration status of a household and takes the following form:

$$I_i = 1 \qquad \text{if } I_i^* > 0$$

$$I_i = 0 \qquad \text{otherwise}$$

Impact of migration on food deprivation

Food Deprivation Outcomes						
Migrant Household			**Non-migrant Household**			ΔO_i
Expected outcome of migrant household $\{E(fd_{1i}\|I_i = 1, X_i)\}$	=	-0.431** (0.001)	*Expected outcome of non-migrant household had it had a migrant* $\{E(fd_{1i}\|I_i = 0, X_i)\}$	=	-0.559** (0.009)	
Expected outcome of migrant household had it not had a migrant $\{E(fd_{0i}\|I_i = 1, X_i)\}$	=	0.014** (0.007)	*Expected outcome of non-migrant household* $\{(fd_{0i}\|I_i = 0, X_i)\}$	=	-0.089** (0.002)	
Change in outcome of migrant household due to migration $\{\Delta O_{1i}\}$	=	-0.445** (0.001)	*Change in outcome of non-migrant household due to migration* $\{\Delta O_{0i}\}$	=	-0.470** (0.001)	
						0.025** (0.001)

Conclusion

- Age, education and having a child at the household of origin matter for remittances to be realized.
- Gender matter for income pooling of remittances with income at the household of origin on frequent and low-cost purchases that characterise the food patterns of poor households.
- Income pooling for high value and infrequent purchases holds for all types of characteristics of migrants; this challenges the concept of a household being a neat separate unit.
- Migrant households with migrants who are more than 30 years, are educated and have children at the household of origin reduce food deprivation more than non-migrant households.
- Migrant household without migrants who remit are worse off compared to non-migrant households and blanket social policy that excludes migrant households from social assistance may be prejudiced.

Thank you