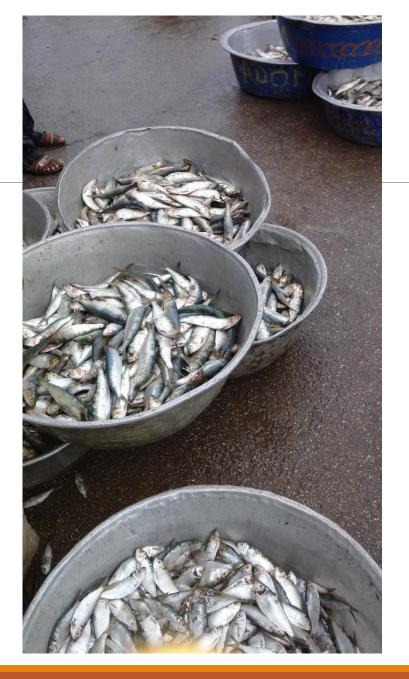
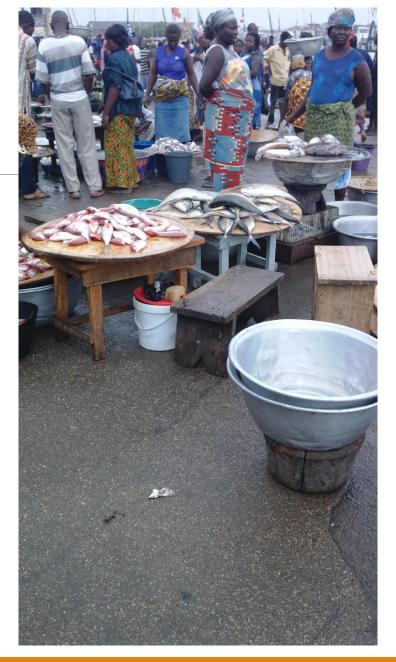
A DOUBLE HURDLE APPLICATION OF FISHERMEN'S CATCH SALES THROUGH FISH MOTHERS IN GHANA

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Introduction

- Marine capture fishery accounts for over 80% of total fish product supply.
- Subsectors: Small scale/artisanal; semi-industrial/inshore; industrial/deep sea; and tuna fleets
 - Small scale / artisanal fishery accounts for 70%-80% of total marine catch
- Main fishes landed by artisanal fishermen: sardinellas (Sardinella aurita), tuna (Auxis thazard), mackerels (Scomber japonicas), burrito (Brachydeuterus auritus), and Atlantic bumper (Chloroscombrus chrysurus).
- Minor fishes:red fish (Sparus caeruleostictus; Dentex angolensis), white grouper (Epinephelus aeneus).



Artisanal Fishery Challenges



- Seasonality, small margins, capital outlay, limited access to formal bank credit, low returns, etc
- * Returns affected by:
 - limited value addition
 - weak backward-forward market linkages
 - poor infrastructure
 - low bargaining power
 - low catch

Role of Fish Mothers

- Women participation rate in pre- and post-harvesting activities is about 48%
- Women play vital role in informal financing of fishing operations
- Marketing & remuneration from fish catch:
 - Greater % goes to "fish mothers" to cover any pre-financing arrangements
 - % to boat owner to cover fixed costs
 - % to hired laborers & as wages
 - Small % shared for meals
- Marketing channels: fish mothers, fish processors, fish retailers, food vendors, relatives, spouses, and direct to consumers.

Selling Through Fish Mothers

Advantages:

- Relatively low cost financing
- Less marketing costs; mostly cash market
- Higher volumes
- Sometimes, higher prices especially fish destined for national, and international markets

Disadvantages:

- ► Lack of bargaining power
- Women may use financing leverage to control production chain



Study Objectives & Data

- * Assess fishermen's fish sale choices as a 2-step decision process
- Examine determinants of fish sales through fish mothers

> Hypothesis: Self-financing negatively affects decision to sell through fish mothers

Data collected in 2013 from artisanal fishermen at major coastal fishing communities in Ghana, i.e., Chorkor, Jamestown, Tema, Elmina, Cape Coast, and Moree

Methodology

- The Double Hurdle (DH) model:
 - > 1st hurdle: Whether or not fisherman sold to fish mothers
 - > 2nd hurdle: fish catch % sold through them
- Test homoscedastic vs heteroskedastic
 - \triangleright variance in error: $\sigma_i = \sigma \times \exp(\delta' \mathbf{h}_{2i})$; $\delta = 0$ vs $\delta \neq 0$

Results

Likelihood ratio test rejects homoscedasticity restriction

	Estimate
Homoskedastic Model	LLF = -52.521
Heteroskedastic Model	LLF = -33.808
χ^2 test statistic	37.426
χ^2 (1,0.01) critical value	6.63

Results

Estimated Parameters from Heteroskedastic Model

	Hurdle 1	<u>Hurdle 2</u>	Hetero. Eq
Weighted average price of all fishes (US\$)		0.015***	
Percentage of high value fish landed (%)		0.002^{*}	
Self-financing for fishing activities (=1)	-0.676**	0.050	
Boat size (meters)	0.320***	1.211***	-2.913***
Experience (years)		0.105***	
Number of fishing trips in a year		0.107***	
At least a primary education (=1)		0.022	
Located in Greater Accra (=1)	0.351	0.012	

Results

Estimated Average Partial Effects (APE) from Heteroskedastic Model

	Prob[y > 0]	E[y]	<u>E[y y>0]</u>
Variable	Coeff.	Coeff.	Coeff.
Weighted average price of all fishes (US\$)	0.004***	0.001***	0.001***
Percentage of high value fish landed (%)	0.000^{*}	0.000^{*}	0.000^{*}
Self-financing for fishing activities (=1)	-0.190**	-0.102**	0.012**
Boat size (meters)	0.094***	1.461***	0.913***
Experience (years)	0.025***	0.008***	0.005***
Number of fishing trips in a year	0.026***	0.008***	0.005***
At least a primary education (=1)	0.005	0.002	0.001
Located in Greater Accra (=1)	0.100	0.056	0.005

Highlights

- (+) effects:
 - % of high value fish landed
 - boat size
 - number of fishing trips /yr
 - experience
- (-) effects: Self-financing.



Conclusions

- Relatively small effect of price
 - Minimal ability of fishermen to negotiate prices with the fish mothers.
- Relatively small effect of high value
 - Could result from low catch.
- Relatively small effect of experience & fishing trips
 - Could relate to quantity of catch.

Conclusions

- * Relatively stronger effects of boat size & self-financing.
 - Capital and investment considerations are important drivers for fishermen's choice of selling catches through fish mothers.
 - Address increasing capital costs associated with artisanal fisheries (larger canoes, high powered motors, fishing equipment, etc).
 - Incentives from formal banking services to minimize poor loan repayment & indebtedness.

Thank you!

Questions?

