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China's Role in the Global Rice Market and Implications for West Africa's Food Security

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Selected presentation for the International Agricultural Trade Research Consortium's (IATRC's) 2023 Annual Meeting: The Future of (Ag-) Trade and Trade Governance in Times of Economic Sanctions and Declining Multilateralism, December 10-12, 2023, Clearwater Beach, FL.

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United States Department of Agriculture

China's role in the global rice market and implications for West Africa's food security

-Research proposal-

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U.S. Department of Agriculture- Economic Research Service
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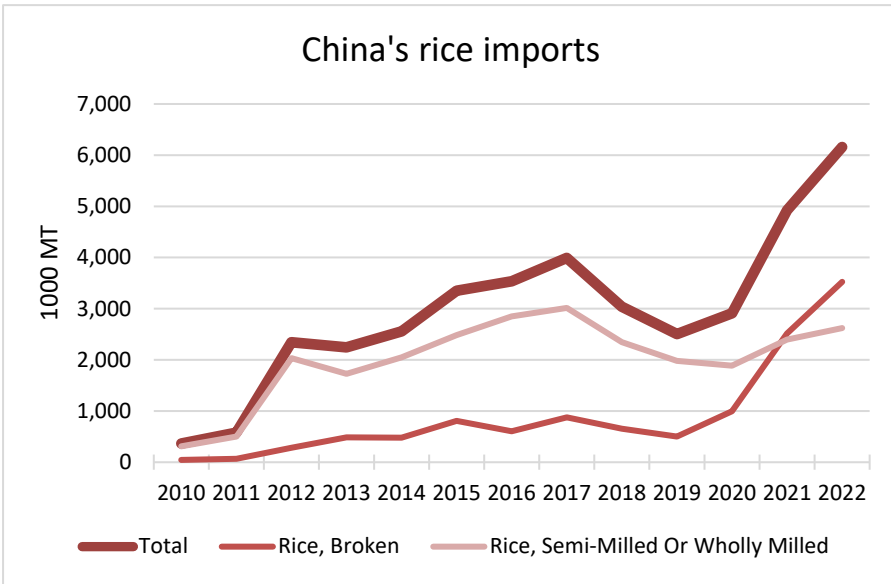


Introduction

- Rice → globally cultivated and consumed
 - Role in global food security
- Around 90% of rice are produced and consumed in Asia
 - China is the largest producer and importer in the world
- Chinese rice imports → more than doubled from 2.9 million MT in 2020 to 6.2 million MT in 2022



Introduction



Source: USDA, Economic Research Service using data from Trade Data Monitor (2023)



Introduction

- China is estimated to hold 60% of the world's rice reserve as of mid-2022
- One reason for the increase in rice imports → increase prices of corn and wheat for feed
 - Low grade rice are imported as substitutes

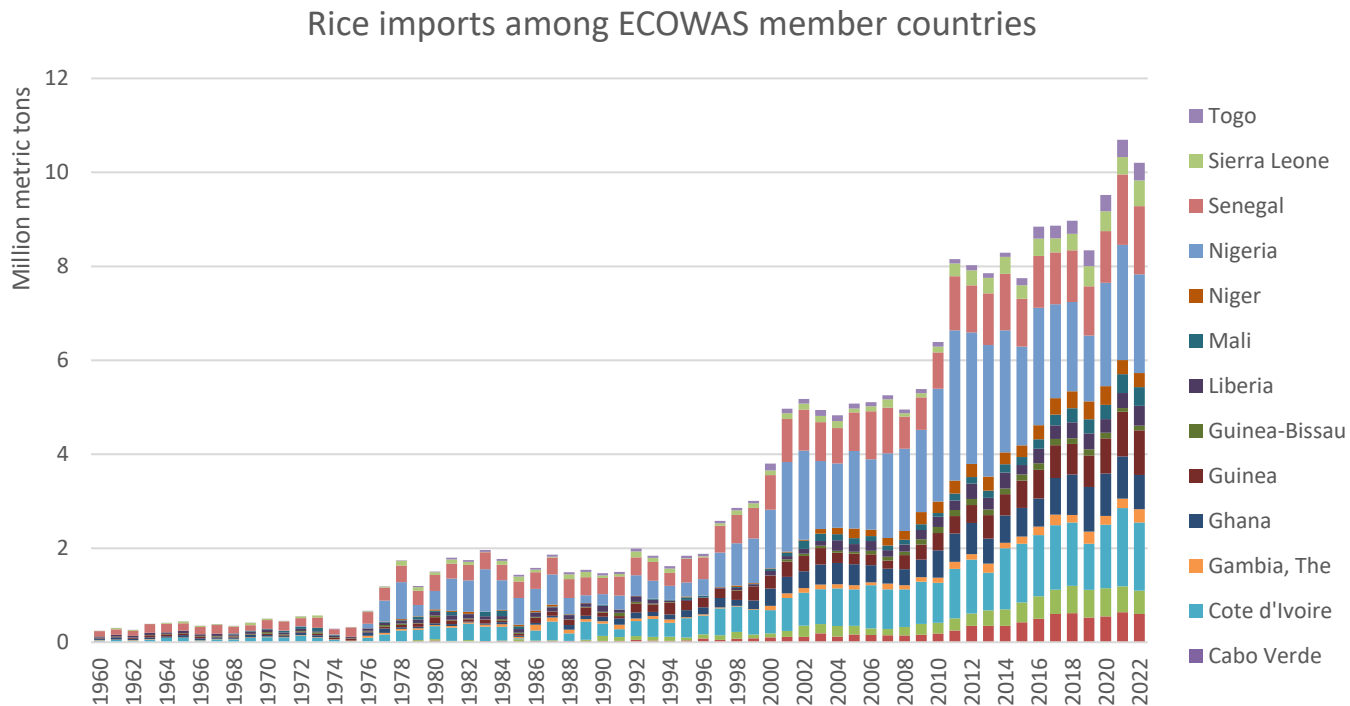


Source: USDA, Economic Research Service using data from Trade Data Monitor and the China National Bureau of Statistics (2023)



Introduction

- In West Africa, rice accounts for the largest source of calories
 - Demand for rice is projected to increase to 24 million MT by 2025
 - Consumption is outpacing production
 - Dependent on imports and global prices

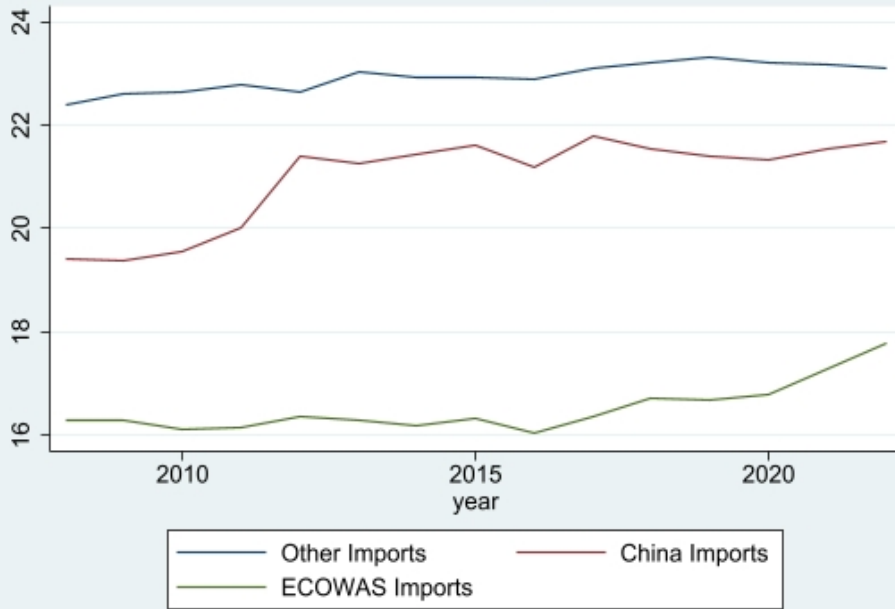


Source: USDA, Economic Research Service using data from Foreign Agricultural Service (2023)

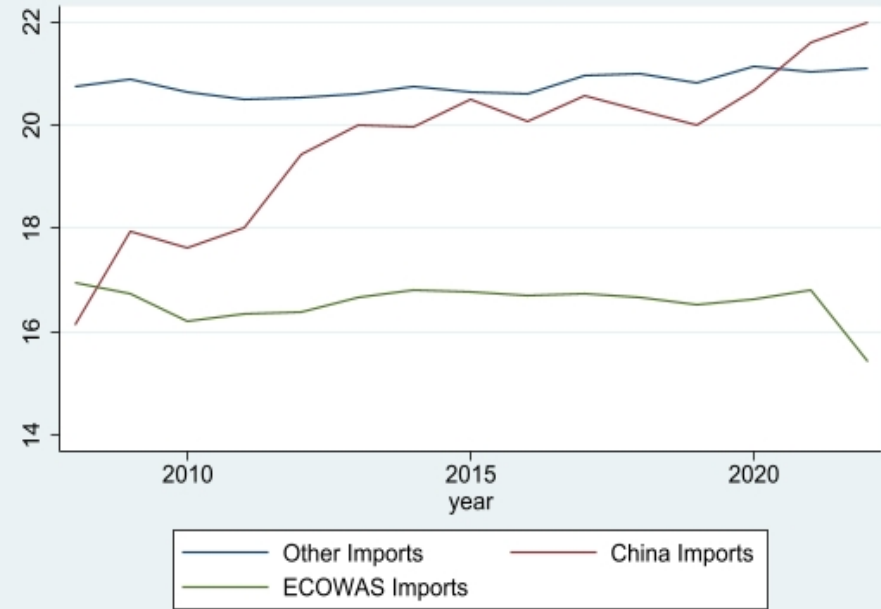


Introduction

Milled Rice Imports



Broken Rice Imports



Source: USDA, Economic Research Service using data from UN Comtrade (2023)



Problem Statement

- China was self-sufficient in rice, yet has emerged as the top importer recently
 - Rice consumption in China as food grain has been stagnant
 - Demand comes from animal feed and distilling liquor
- West African countries importing to meet consumption demands
 - The dependency on imports makes West African countries vulnerable to price shocks, since low-income countries spend a bigger share of expenditure on food



Problem Statement

- China and West Africa import rice from the same regions
 - Will China's demand compete with West African demand in the global rice market?
 - Does China respond to changes in world market conditions OR
 - Does China's demand influence world prices?
 - Is there evidence that West Africa's share of rice imports is inversely related with China's share?



Research Objectives

- To assess China's position in the global rice market and how it affects food security in West African countries
 - Analyze trends in rice production, consumption, stocks, and imports in both China and West African countries and how it relates to global prices.
 - How do these factors associate with price movements?
 - Does China respond to world market conditions, or does it demand influence world prices?
 - How does a relatively small increase in Chinese rice imports affect changes in world prices and imports in West Africa?
 - What are the implications for the food security status of West African countries?



Proposed Econometric Method

- PPML Gravity Model

$$X_{ijt} = \exp[\beta_0 + \beta_1 \ln Dist_{ij} + \beta_2 \ln Prod_{it} + \beta_3 \ln GDP_{it} + \beta_4 FTA_{ijt} + \beta_5 Dispute_{ijt} + \beta_6 \ln ImportsCh_{jt} + \beta_7 \ln ImportsOth_{jt} + \theta_i + \mu_j + \delta_t] + \epsilon_{ijt}$$

Variables	Definitions	Data Sources
X_{ijt}	ECOWAS rice imports	UN Comtrade/TDM
$\ln Dist_{ij}$	Distance	CEPII
$\ln Prod_{it}$	Rice production of ECOWAS	FAOSTAT
$\ln GDP_{it}$	GDP of ECOWAS	World Dev. Indicators
FTA_{ijt}	Free trade agreements	CEPII
$Dispute_{ijt}$	Diplomatic disputes	CEPII
$\ln ImportsCh_{jt}$	Chinese rice imports	UN Comtrade/TDM
$\ln ImportsOth_{jt}$	Importers –other countries	UN Comtrade/TDM
θ_i	Importer fixed effects	
μ_j	Exporter fixed effects	
δ_t	Time fixed effects	



Preliminary results

ECOWAS Imports	All Rice	Milled	Broken	Chinese Imports	All Rice	Milled	Broken
Ln Import qnty Other	-0.0852 (0.178)	3.460* (1.963)	-0.902 (0.820)	lnTradeqnty_Other	0.570*** (0.00737)	1.670*** (0.0120)	-0.207*** (0.0265)
Ln Import qnty China	-0.0466 (0.198)	-2.325** (1.018)	0.347*** (0.101)	lnTradeqnty_ECOWAS	0.00137 (0.00135)	1.34e-05 (1.93e-05)	-0.000374 (0.000892)
Ln Production ECOWAS	-0.121 (0.121)	0.460 (0.317)	-0.324*** (0.0868)	lnPrice_mean_China	0.00176 (0.00224)		
				lnMilled_price_China		-0.000108 (0.000160)	
				lnBroken_price_china			-0.116 (0.118)
Observations	4,130	2,047	2,083	Observations	1,370	183	276
Exporter FE	YES	YES	YES	Exporter FE	YES	YES	YES
Year FE	YES	YES	YES	Year FE	YES	YES	YES

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1



Thank you!

Questions or comments?

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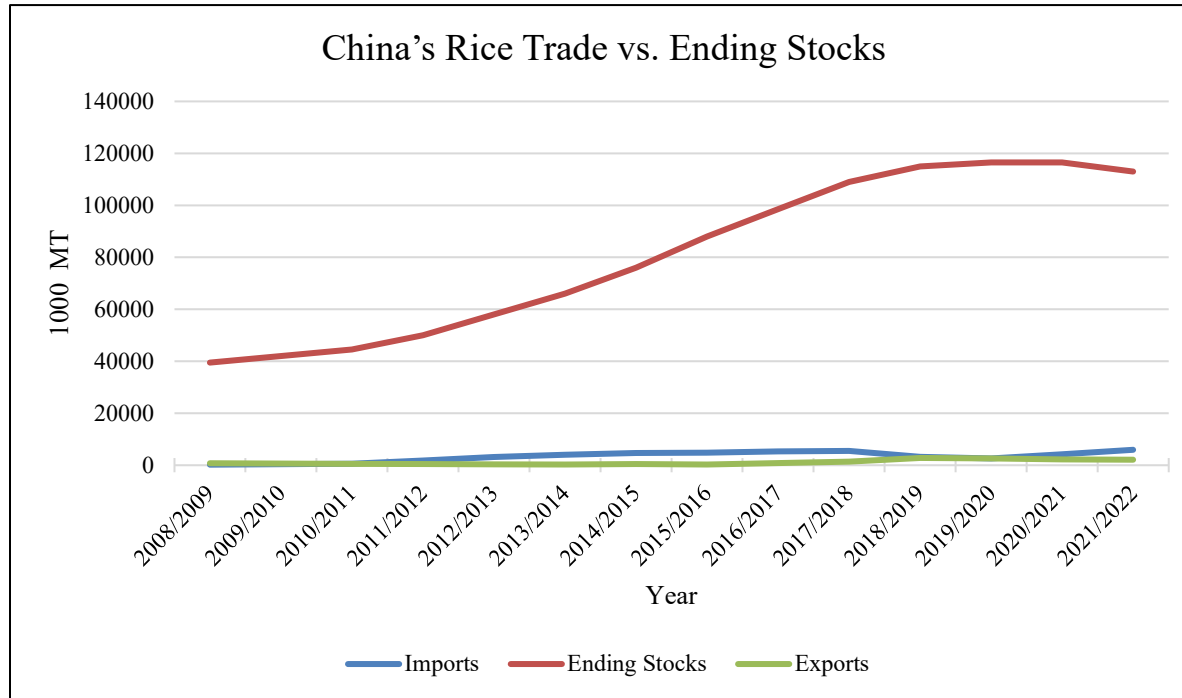
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Appendix



Source: USDA, Economic Research Service using data from Foreign Agricultural Service PSD (2023)



Appendix

Other Top 10 Rice Importing Countries

Brazil

Ethiopia

EU 27

United Kingdom

Iran

Japan

Kenya

Sri Lanka

Madagascar

Mexico

Malaysia

Philippines

Saudi Arabia

USA

South Africa

