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Nexus between financialization of agricultural products and food security amid financial crisis: empirical insights from BRICS

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Abstract

Purpose – The study endeavors to explore whether the financialization of agricultural commodities, traditionally viewed as a catalyst for price volatility, has any repercussions on food security in BRICS economies.

Design/methodology/approach – The empirical analysis employs the examination of three agricultural commodities, namely wheat, maize and soybean. Utilizing data from the Chicago Board of Trade on futures trading for these commodities, we focus on parameters such as annual trading volume, annual open interest contracts and the ratio of annual trading volume to annual open interest contracts. The study spans the period 2000–2021, encompassing pre- and post-financial crisis analyses and specifically explores the BRICS countries namely the Brazil, Russia, India, China and South Africa. To scrutinize the connections between financialization indicators and food security measures, the analysis employs econometric techniques such as panel data regression analysis and a moderating effects model.

Findings – The results indicate that the financialization of agricultural products contributes to the heightened food price volatility and has adverse effects on food security in emerging economies. Furthermore, the study reveals that the impact of the financialization of agricultural commodities on food security was more pronounced in emerging nations after the global financial crisis of 2008 compared to the pre-crisis period.

Research limitations/implications – This paper seeks to draw increased attention to the financialization of agricultural commodities by presenting empirical evidence of its potential impact on food security in BRICS economies. The findings serve as a valuable guide for policymakers, offering insights to help them safeguard the security and availability of the world's food supply.

Originality/value – Very few studies have explored the effect of financialization of agricultural commodities on food security covering a sample of developing economies, with sample period from 2000 to 2021, especially at the individual agriculture commodity level. Understanding the evolving effects of financialization is further improved by comparing pre and post-financial crisis times.

Keywords Financialization of agricultural commodities, BRICS economies, Food security, Food price volatility

Paper type Research paper

1. Introduction

Food security, encompassing the availability, accessibility and utilization of food for all individuals at all times, remains a significant concern, particularly in emerging economies. India, in particular, faces a notable challenge in this regard, ranking 101th out of 116 countries on the 2021 Global Hunger Index (GHI). This positioning places India behind neighboring nations such as Bangladesh, Pakistan and Nepal. China stands out as one of the top-ranked

JEL Classification — Q14, E44, G15, Q18

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nations, boasting a GHI value less than 5. Analyzing the percentage of the population grappling with undernourishment provides additional insight into the severity of the issue across these countries. India, with nearly 16% of its population undernourished, faces a more pronounced challenge than its counterparts. Brazil reports 4%, China 3% and Russia 3% in terms of undernourished populations (World Health Organization, 2020). Persistent challenges contributing to food insecurity include inadequate access to nutritious food, prevailing poverty and the impacts of climate change. The emergence of the COVID-19 pandemic has exacerbated the problem of food poverty, with widespread consequences on employment, income and subsequently, access to food. In India, for instance, a Hunger Watch report revealed alarming statistics during the pandemic, with 25% of families experiencing acute food insecurity, 79% reporting a decline in food consumption and 66% witnessing a loss in income (RTFS and CES, 2022). The compounding effects of existing challenges and the recent global health crisis highlight the urgent need for comprehensive strategies to address food security concerns in these vulnerable populations.

Agriculture stands as the bedrock of numerous emerging economies, contributing significantly to their GDP and serving as a primary source of employment for millions (Manogna and Mishra, 2020; Manogna, 2021b). However, the agricultural sector grapples with the complexities brought about by the financialization of agricultural goods and its consequential impact on food security. The term "financialization" denotes the growing prominence of financial markets, institutions and motivations in the broader economy and society. This phenomenon is associated with various economic and social shifts, including heightened income inequality, the disproportionate expansion of the financial industry vis-à-vis other economic sectors and increased volatility within financial markets. The consequences of financialization extend to the very fabric of food security and the livelihoods of small-scale farmers. The ability of a country to adequately feed its population is profoundly influenced by the financialization of agricultural products. A compelling case illustrating the substantial impact of financialization on food security is evident in Brazil. As a major producer and exporter of commodities like meat and soybeans, Brazil actively participates in extensive trade. However, this has resulted in significant challenges, including deforestation, alterations in land use and volatility in prices within the Brazilian context (Faria and Almeida, 2016; Manogna and Mishra, 2021a; Manogna, 2021a). The intricate relationship between financialization and the agricultural sector underscores the need for careful examination and strategic interventions to ensure sustainable food security and the well-being of those engaged in agriculture, particularly in BRICS economies.

The financial crisis of 2008 affected multiple sectors of the global economy. The agricultural sector is a notable example. The economic slowdown and financial instability initiated by the housing crisis in the United States extended fast to other nations as well. The year 2008 shows an apparent dip for every nation caused by the financial crisis. Agriculture is a major contributor to the GDP of these nations, and for such a significant impact on GDP growth, the sector must be affected majorly (Manogna and Mishra, 2021b, 2022a). A significant impact of the financial crisis was an abrupt rise in the cost of food. Factors such as population expansion, shifting dietary trends and a rising need for biofuels added fuel to fire, causing the demand for agricultural commodities to increase during the financial crisis. Increased demand and decreased market liquidity generated a favorable environment for price volatility (Manogna *et al.*, 2024).

The financial crisis also made public the global food system's underlying structural problems. Price volatility was exacerbated by the rising financialization of agricultural commodities, manifested in the presence of more and more financial investors and the use of derivatives for speculating. Financial institutions entered the commodities markets in search of more significant returns, frequently without having a direct stake in the delivery of the underlying goods. This financial speculation added a new degree of

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complexity and increased price volatility, which impacted the accessibility and affordability of food.

Concerns about the impact of financialization on food security are shared among policymakers, farmers and civil society organizations globally. This financialization of agricultural products can have both positive and negative effects on the food security landscape. One potential benefit is that it may offer farmers improved means of price discovery, potentially resulting in better prices for their produce. Through the use of futures contracts and other financial tools, farmers can hedge against price changes and safeguard their revenue. However, financialization also carries potential risks, particularly in terms of food availability. Small-scale farmers, who form the majority in many emerging economies, are particularly vulnerable to the volatility in prices on international markets. The utilization of financial instruments in agricultural markets can make it challenging for them to predict prices and plan their harvests, exacerbating market volatility (Manogna and Mishra, 2022b, 2023; Manogna and Anand, 2023). This, in turn, may make it difficult for consumers to find affordable and nutritious food due to increased price volatility resulting from financial speculation.

The Food Security indicator from the FAO encompasses various aspects such as price, income, accessibility, sufficiency, safety and nutritional considerations. Financial instruments in agricultural markets can indeed provide liquidity and aid in price discovery, but they also introduce risks. The growing involvement of financial speculators in farm markets has led to increased price fluctuations, raising concerns about speculative bubbles and market volatility. While these financial tools can assist farmers in managing risk, challenges such as higher supply costs or reduced income during price declines may arise. As the global food system becomes more interconnected and susceptible to market shocks, the potential impact of financialization on food security has emerged as a growing concern. Commodity market speculation, for instance, can lead to sudden price increases, making it more challenging for low-income consumers to access food. Furthermore, the prioritization of investments in larger, internationally linked markets by financial actors may deter investment in local and regional food systems, posing additional challenges to food security. The complex interplay between financialization and food security necessitates careful consideration and thoughtful policy interventions to strike a balance that benefits both farmers and consumers.

Given its potential repercussions on the well-being of every resident in a nation, policymakers face the crucial task of striking a delicate balance between advancing financialization and safeguarding the interests of small farmers and marginalized groups. Prominent among the proposed solutions are initiatives such as increased investments in local and regional food systems, support programs for small-scale farms and the establishment of more transparent and equitable market mechanisms. This study aims to contribute to a nuanced understanding of this intricate issue by conducting an analysis of the impact that the financialization of agricultural commodities has had on food security in BRICS nations, including India, Russia, China, Brazil and South Africa. The focus is specifically on key crops such as wheat, maize and soybeans. The structure of the remaining sections of this study is as follows: Section 2 provides an overview of the existing literature on the subject. Section 3 elucidates the econometric methodology employed in the study and provides a description of the data utilized. Section 4 presents the empirical findings derived from the analysis. Section 5 engages in a comprehensive discussion of the results, and the study concludes in Section 6, summarizing key insights and implications.

2. Literature review and hypothesis

The term "financialization" encompasses the process of transforming non-financial assets, such as real estate or tradable commodities, into assets that can be traded on financial

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markets. In the context of agriculture, financialization refers to the practice of trading agricultural products, such as grains, oilseeds and pulses, on commodity exchanges, futures markets and other financial platforms. According to Epstein (2005), financialization involves the increasing influence of financial institutions, markets and elites on economic policies and outcomes. Factors such as deregulation, globalization and advancements in financial technology have contributed to this growing trend (Krippner, 2005). The evidence supporting the prevalence of financialization in contemporary society is underscored by data indicating that financial market activity has outpaced actual economic activity. Additionally, financial profits constitute a larger share of total profits, and both households and the financial sector are taking on significantly more debt. These trends provide compelling indications of the pervasive influence of financialization on various aspects of the modern economy (Stockhammer, 2010).

The effects of financialization on the economy have been extensive, changing company governance, investment behavior and income distribution (Dymski and Pollin, 2015). Instability in the financial markets and rising economic inequality have been connected to financialization (Zalewski and Whalen, 2010; Manogna and Mishra, 2022c; Manogna *et al.*, 2021). The agricultural industry is one of the non-financial industries that has been touched by financialization. Through their research, Clapp and Isakson (2018) put forward the claim that financialization has resulted in the creation of newer financial instruments that can enable investors to make profit from changes in the price of commodities such as agricultural goods. This has caused the agricultural markets to become more volatile and hence affecting the availability of food. Furthermore, a 2012 research paper by Clapp and Helleiner (2012) explains that financialization has increased price volatility in agricultural markets, which can result in food insecurity.

Since the beginning of the 2000s, India has seen an increase in the financialization of agricultural goods. The National Commodity and Derivatives Exchange (NCDEX) and the Multi Commodity Exchange (MCX) established commodity exchanges. They introduced futures trading in agricultural commodities in 2003 and 2004, respectively, which marked the beginning of the financialization of agriculture in India. In Vietnam, coffee futures issued by the BCEC and VNX failed due to a lack of build-up of liquidity. Lizé (2019) states that the main problems for this failure were the lack of financial literacy, the complexity of delivery of the futures and less access for farmers to the futures market. By offering a platform for price discovery and hedging, financialization proponents contend that creating Commodity Exchanges aids farmers in managing pricing risks. Conversely, detractors contend that financialization has worsened market instability in agriculture, harming farmers' earnings and food security.

Over time, several organizations and academics have defined and revised the concept of food security. The capacity of people, households and communities to obtain enough food that is safe, nourishing and meets their dietary needs and preferences for an active and healthy life is generally referred to as food security. The World Food Summit in 1996 came up with one of the oldest and most often used definitions of food security: "when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life" (World Food Summit, 1996).

The impact of financialization on food security is continually debated. Several researchers have published results stating that financialization has not impacted food security, while others have stated otherwise (Manogna and Nishil, 2024; Manogna and Mishra, 2021c). Vercammen and Doroudian (2014) show that traders that held on to food grains in the name of portfolio diversification did not affect the price volatility of those individual grains. Brunetti *et al.* (2016) used a dataset from 2005 to 2009 to identify whether speculators can cause price volatility. Contrary to the general notion, the authors found that speculation did not destabilize the market. In fact, speculative trading helped reduce market volatility and help

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improve overall market quality. Irwin and Sanders (2011) state that the reason for the price spike during the financial crisis of 2007–2008 was the fundamental supply and demand problem and not excessive speculation.

A study by Srinivasan (2008) states that futures trading in agricultural commodities positively impacted price discovery and market efficiency. Another study by Prager *et al.* (2020) analyzed the hedging strategies of farmers in the USA cultivating corn and soybean. They found that these farmers use futures contracts in their hedging strategies to mitigate any risk from price fluctuations in the market. This resulted in a positive impact on farmers' incomes. Narasimhulu and Satyanarayana (2016) examined the efficiency of commodity futures with respect to price discovery for Indian agricultural commodities. The authors considered chana, chilli and turmeric in their analysis, which shows that there exists a long-run association between the spot and future prices of these commodities.

Other scientific research papers have highlighted the negative impact of financialization on agricultural markets. A study by Schaffnit-Chatterjee *et al.* (2010) found that the introduction of futures trading in agricultural commodities had led to increased volatility in prices, which had negatively impacted farmers' incomes. They show that the profit margin in agriculture is consistently reducing, and a slight change in prices can cause strong fluctuation in farmers' income. Another study by Gilbert (2010) found that financialization had led to increased speculation in agricultural markets, which resulted in price bubbles and food price inflation. Further analysis by Baffes and Haniotis (2010) includes accounts by hedge fund managers, policymakers and economists that index investments were one of the primary reasons for the price spike of agricultural commodities during the 2007–2008 financial crisis. This point is reinforced by the results from Tang and Xiong (2012), which show that higher degrees of financialization lead to a higher correlation between commodity prices and stock prices. Threshold autoregressive by Aït-Youcef (2019) shows that financial mechanisms significantly impact commodity markets during extreme movements, potentially influencing the financialization of commodities. Independent analysis conducted by Frenk (2010), Gheit (2008) and Masters (2008) argue that the introduction of the "Commodity Futures Modernization Act" in the US has caused increased monetary injection into commodity derivatives, often driving the price above and below optimal levels. Ouyang and Zhang (2020) provide evidence of the negative impact of agricultural product financialization in China. They show that the commodities and financial markets have a dynamic correlation which is increasing in nature.

Another negative impact of financialization on agricultural commodities is the concentration of market power in the hands of a few prominent players. Visser's (2015) analysis shows that in Russia, extensive agricultural holdings are sometimes assisted by real estate consultants who are the central actors. Kuns *et al.* (2016) goes further to show that large-scale farming businesses backed by the stock market are unlikely to have a significant impact on the region's direct food production in the future. Financialization helps shelter food security in the current global food market system and makes developed countries more self-indulgent (Fahim and Rahman, 2022). Fahim (2022) also highlight the presence of multiple food companies formed in developed nations that draw their funds from commodity indices. According to Vijayabaskar and Menon (2018), the emergence of new financial instruments that enable investors to profit from fluctuations in commodity prices has led to the concentration of market power in the hands of a few significant players. This reduces competition and boosts food prices, making it more difficult for impoverished people to obtain food. They show that land grabbing has increased in the periphery of Chennai, where non-agricultural entities were purchasing large swathes of land to profit from speculation. A similar result can be observed in Cotula (2011), who found that financialization increases land grabbing by large-scale investors in developing countries for agricultural purposes.

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This displaces small-scale farmers and negatively impacts their livelihoods and the overall food security of the national food insecurity.

The relationship between market speculation and price volatility has long been questioned. According to the Efficient Market Hypothesis, developing reliable estimates of future values from previous data is difficult since the current asset price integrates all relevant information. According to Irwin and Sanders (2010), there is no compelling evidence that market speculation generates commodity price bubbles. Gilbert (2010) and a group of other researchers, on the other hand, uncovered the inverse. Price volatility in rice, wheat and maize has increased as more investors participate in agricultural commodities financing speculation (Tujan and Director, 2013).

H1a. Higher the degree of financialization of agricultural produce, the more dramatic the volatility in their prices and the more significant the negative impact on food security.

The global financial crisis began in 2007–2008 and had far-reaching effects on global markets and economies. It influenced the dynamics of agricultural commodity markets and their impact on emerging nations. Agricultural commodity markets were less integrated globally before the crisis. Financial institutions were also less engaged in agricultural commodity trading and speculation, potentially resulting in a lower impact on food security in emerging nations. The involvement of financial actors and the intensity of financialization were lower compared to the post-crisis era. The presence of economic actors engaging in speculative trading can amplify price fluctuations, making it difficult for emerging nations to stabilize food prices and plan agricultural production effectively. Speculators seeking quick profits can create price bubbles, distorting supply and demand fundamentals. With limited resources and weaker market institutions, BRICS nations find it challenging to cope with these speculative activities. Financialization has shifted the composition of market participants, with financial actors gaining a more dominant role. Emerging nations, which rely heavily on agriculture for domestic consumption and livelihoods, may need help ensuring food security if market dynamics are distorted by financialization. This makes it plausible for us to consider a third hypothesis in our study.

H1b. The financialization of agricultural commodities on food security has a more considerable impact on BRICS nations post global financial crisis compared to pre-financial crisis period.

3. Data and methodology

3.1 Financialization index construction

Financialization of agricultural commodities is the most important explanatory variable in the investigation. For wheat, maize and soybean futures traded on the Chicago Board of Trade, we utilize annual trading volume, annual open interest contracts and a ratio of annual trading volume to annual open interest contracts. Yearly numbers for maize, wheat and soybean futures are sourced from the Bloomberg database. To examine the effect of commodity financialization in influencing food security, we quantify the rise in speculative activity on the agricultural commodity market using these measures.

Variable 1: annual trading volume of futures contracts

This indicates the annual volume of commodity futures traded on the Chicago Mercantile Exchange (CME). It entails combining multiple short-term futures contracts into a single long-term historical dataset. A greater trading volume shows that more traders are

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participating in these markets. This can also signify a huge number of short-term futures contracts (Robles *et al.*, 2009).

Variable 2: annual open interest in futures contracts

Open interest is the sum of all commodity futures contracts that have not yet been settled by delivery, exercise or an opposite futures position. Open interest is produced when a trader enters a futures contract position. The position stays open interest until the trader establishes a counterposition or the contract expires (Robles *et al.*, 2009). On the commodity futures market, a greater value for open interest may indicate a greater quantity of medium- and long-term futures contracts.

Variable 3: ratio of annual trading volume to annual open interest in futures contracts

A rise or decrease in the ratio is anticipated to reflect speculative actions in the commodities futures market, assuming that most speculators choose to enter into short-term contracts as opposed to hedgers, who enter into long-term contracts to hedge against future price volatility. An increase in the number of short-term contracts executed by speculators will result in a rise in yearly trading volumes. Nonetheless, it will have a little effect on the yearly open registered interest. This indicates a rise in this ratio. This ratio is therefore anticipated to also accurately reflect the activity of market speculators (Robles *et al.*, 2009).

Since these three indicators differ in their measurement of the financialization of agricultural commodities, conclusions may be skewed if only one indicator is used. Consequently, this analysis uses the aforementioned three indicators as a foundation and use principal component analysis to develop a composite index of agricultural commodity financialization. This index is calculated separately for wheat, corn and soybeans, and by averaging the three, an overall agricultural commodity financialization index is constructed.

3.2 Data description

The dependent variable for this study is food security. Food security indicator is taken from FAO database which considers price, income, accessibility, sufficiency, safety and nutritional aspect of food security. The data used in this study is sourced from the FAO database, World Bank's World Development Indicators and the Bloomberg database. Wheat, corn and soybean being one the most highly traded agricultural commodities on the Chicago Board of Trade (as well as worldwide) and also being very important for agricultural production and consumption, are selected as the object of this study, and other agricultural products are refrained from being selected as samples for the empirical analysis in this study. The data sample covers emerging economies of BRICS countries namely the Brazil, Russia, India, China and South Africa. Globally, these countries are important food producers and consumers, and studying them is essential to understand the impact on food security due to financialization of agricultural commodities. At the same time, based on the global Human Development Index (HDI) as a measure for establishing the different levels of economic development, these five countries are finally selected as our sample. The sample period is 2000–2021, and annual panel data are constructed for this period. The core explanatory variable is the financialization of agricultural commodities which is constructed as detailed above. Other control variables are annual GDP growth rate (expressed in percent), annual consumer price inflation rate (expressed in percent), arable land (expressed as percentage of total land area), food price index (2015 = 100), exchange rate (LCU per US$, period average), energy price index, food production index and log of GDP per capita. Table 1 gives the definitions of all regression variables used in the study.

Among the five countries, across 2000–2021 with a total of 105 observations, the food price index has a maximum value of 123.51 and a minimum of 37.93. The higher variance indicates

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Variables	Definitions
FS	Food Security (Food security indicator from FAO considering price, income, accessibility, sufficiency, safety and nutritional aspect of food security)
FD	Composite Agricultural Financialization Index is constructed by a combining the wheat, corn and soybean financialization using Principal Component Analysis
Control variables	
gdpgr	This variable represents the annual GDP growth rate
arbl	This variable represents the total arable land of a country as a percentage of total land area
fpricein	This variable represents the annual Food Price Index
infl	This variable represents the annual consumer price inflation
energypri	This variable represents the annual Energy Price Index
exchg	This variable represents the average annual exchange rate of local currency against US dollar
fprodin	This variable represents the annual Food Production Index
lngdppc	This variable represents the log of annual GDP per capita

Note(s): This table shows the definitions of main dependant and independent variables used in the regression analysis in the study
Source(s): Authors' representation based on Bloomberg database

Table 1.
Definitions of key regression variables

volatility in food prices. The composite financialization index (FD) has a maximum value of 1.32 and a minimum of −1.04. The higher variance in the global energy price index indicates that energy prices have been significantly volatile in the past 20 years. Across the sample, food security (FS) has a maximum of 13.90 and a minimum of 4.96. Table 2 gives the summary statistics of all variables.

3.3 Methodology

3.3.1 Basic panel data regression model. This paper constructs a fixed-effects model to explain the impact of financialization of agricultural commodities on food security. This model is run for two separate time periods – 2000–2007 and 2008–2021, to investigate the impact of global financial crisis on the changing dynamics of the impact of financialization on food security in BRICS economies. The regression model is estimated as given in Equation (1).

$$FS_{i,t} = \alpha_i + \beta_0 + \beta_1 control_{i,t} + \beta_2 financialization_{i,t} + \mu_{i,t} \quad (1)$$

where FS is the food security (availability of food to meet daily nutritional needs) at time t. Financialization is the primary explanatory variable in this study, and is equated to FD

Variable	Mean	Std. Dev	Min	Max
FS	8.65	3.09	4.96	13.90
FD	0.04	1.03	−1.04	1.32
fpricein	73.10	29.23	37.93	123.51
energypri	83.19	26.74	44.89	125.48
fprodin	88.57	18.76	61.42	116.38
lngdppc	8.32	0.40	7.64	8.89
gdpgr	5.96	3.32	−6.60	8.68
arbl	53.00	0.62	52.26	54.13
infl	6.14	2.64	3.33	11.99
exchg	54.73	11.18	41.35	74.10

Source(s): Authors' calculation based on Bloomberg database

Table 2.
Summary statistics of key variables

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(composite financialization). The control variable includes all the control factors utilized in this investigation. The term μ at time t represents random error. The term α is the individual fixed-effects term. The findings of Hausman's Test exclude random effects; hence panel fixed effects regression models are employed in this investigation.

4. Empirical results and analysis

4.1 Basic panel regression results

In order to test hypothesis H1a, to investigate the impact of the financialization of agricultural commodities on food security in BRICS economies, this study presents a panel data regression model for five BRICS countries named above from 2000 onwards till 2021. Table 3 reports the results of the total sample regression. The coefficient of financialization is −0.1843 and is significant at a 1% level. This indicates that financialization has negatively affected food security in this time frame for BRICS economies. The coefficient of the percentage of arable land (arbl) and Energy price index (enpi) negatively affect food security, significant at 1 and 10%, respectively. The results indicate that the GDP growth rate and inflation rate have no significant relationship with food security. Log of GDP per capita has a coefficient of 0.78 significant at a 1% level, indicating that food security has improved as incomes rise. The food price index has a coefficient of −0.0832, significant at a 1% level. This indicates that financialization leads to increased volatility in food prices, negatively affecting food security.

4.2 Food security impact – pre financial crisis versus post financial crisis

In order to test hypothesis H1b, to investigate the effect of financialization on food security in BRICS economies pre and post the global financial crisis, this paper carriers out two panel data regressions as detailed earlier for the years 2000–2007 and 2008–2021 separately. Table 4 reports the complete sample regression results carried out separately for the two periods using the overall agricultural commodity financial index constructed earlier using Principal Component Analysis (PCA).

In the pre-financial crisis period, we find that the co-efficient of financialization is insignificant, and we find no significant relationship between financialization and food security in BRICS economies. Energy Price Index (enpi) is significant at a 1% level and negatively affects food security during this period. The exchange rate coefficient (exchg) is also significant at 1%. Post-crisis, however, we find that the coefficient of financialization is

	Food security	
	Coefficient	Std. Error
FD	−0.1843***	0.0314
gdpgr	0.0034	0.0010
arbl	−0.0746***	0.0253
fpricein	−0.0832***	0.0045
infl	−0.0020	0.0033
energypri	−0.0008*	0.0005
exchg	0.0000***	0.0000
frpodin	0.0080***	0.0044
lngdppc	0.7800***	0.0684
Constant	8.9469***	0.7445
F-statistic	28.19***	

Note(s): *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$
Source(s): Authors' calculation based on Bloomberg database

Table 3. Effect of financialization on food security in BRICS economies

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	Food security	
	Pre crisis (2000–2007)	Post crisis (2008–2021)
FD	−0.0500	−0.1252**
	(0.0512)	(0.0356)
gdpgr	−0.0008	−0.0072
	(−0.0046)	(−0.0041)
arbl	−0.0078	−0.0434**
	(0.0128)	(0.0167)
fpricein	0.1274***	0.1561***
	(0.0017)	(0.0219)
infl	−0.0013	−0.0106**
	(0.0243)	(0.0716)
energypri	−0.0004***	0.0010*
	(0.0086)	(0.00072)
exchg	0.0522***	0.0000***
	(0.1310)	(0.0006)
fprodin	0.0000	0.0032
	(0.0042)	(0.0072)
lngdppc	−0.4432***	−0.8977***
	(0.0612)	(0.1992)
Constant	3.6201***	8.5459***
	(0.6220)	(1.0588)
R^2	0.7857	0.8681
F-statistic	4.56***	4.81***

Note(s): Robust standard errors are reported in parentheses. *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$
Source(s): Authors' calculation based on Bloomberg database

Table 4.
The results of regression – pre crisis and post crisis

significant at a 5% level and negatively affects food security. This indicates that the BRICS markets, post-financial crisis, are flooded with more speculators, creating higher agricultural price bubbles and making these economies fragile to agricultural price volatility that threatens food security. The arable land percentage is significant at the 5% level, the food price index is significant at the 1% level, the inflation rate is significant at the 5% level and negatively affects food security in the post-crisis period, the energy price index is significant at 10% level and log of GDP per capita is significant at 1% level.

5. Results discussion

The regression results as obtained in Table 3 show that the coefficient of the complex variable that has been created to denote financialization is negative. When we consider a confidence interval of 1%, this coefficient becomes significant. At the same confidence level, other variables such as inflation does not display a significant relationship with respect to food security. These findings support the first hypothesis that has been described in this study. It affirms the fact that the more agricultural produce is financialized, the more volatile its prices will be and the more detrimental an impact it will have on food security.

The 2008 financial crisis is often cited as a tipping point for the increased investment in financial products associated with the commodity market. The results in Table 4 help us to analyze the extent of the impact that financialization had of food security in BRICS nations before and after the event. According to the results obtained, the coefficient of financialization is insignificant at a 1% confidence level in the period before the financial crisis. At the same confidence level, the Energy Price Index and Exchange Rate act as more significant variables that had an impact on the food security during this period. The analysis for the post-crisis

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data shows that the coefficient of financialization is negative and significant at a confidence level of 5%. This shows that the global financial crisis of 2008–2009 exacerbated the negative impacts of financialization on food security which reinforces our third hypothesis.

These results provide a deeper understanding on the impact that financialization of agricultural products have on food security. Some of the results come in direct contradiction with earlier studies such as Brunetti *et al.* (2016) whose research showed that financial actors cannot destabilize price volatility.

6. Conclusion and implications

The global population's continuous growth adds relentless pressure on existing food production and distribution systems. Natural occurrences like climate change and land degradation exacerbate these challenges, placing further strain on food production. Moreover, instances of political instability, such as the recent unrest in Ukraine leading to a global food shortage crisis, highlight the critical importance of addressing food security on a global scale. As agricultural items become increasingly financialized, the influence of macroeconomic and financial markets on food security intensifies. In the current scenario of a global economic downturn and heightened market volatility, each nation faces an escalating risk to its food security. The subsequent findings are derived from the analysis in this article, specifically examining the impact of commodity financialization on food security. The study focuses on contracts for wheat, maize and soybeans traded on the Chicago Board of Trade, shedding light on the intricate relationship between financial markets and the global food security landscape.

Firstly, according to the results of the fundamental panel regression analysis, the financialization of the three commodities (soybean, wheat and maize) has had a negative impact on their food security index as indicated by the negative coefficient for the composite financial index with a significance level of 1% in all of the BRICS nations that have been considered for this analysis.

Additionally, this paper affirms the fact that the financial crisis of 2008 was an important checkpoint post which the increased financialization has led to food insecurity among BRICS economies. In contrast to the pre-crisis period, the coefficient of financialization obtained using regression analysis yielded a negative and significant value in the post-crisis period. Several reasons are often cited for this case. The financial crisis led to declining traditional investment opportunities like stocks and bonds. Following the financial crisis, central banks worldwide lowered interest rates to stimulate economic growth. This made it more attractive for investors to invest in assets that offered higher returns, such as agricultural commodities. BRICS nations are more dependent on imported food and need more capacity to regulate the financial markets. As a result, the financialization of agricultural products has made it more difficult for BRICS nations to ensure food security for their citizens.

The insights gleaned from this paper contribute valuable perspectives to the understanding of a complex and multifaceted issue. The findings underscore the importance of implementing regulations and policies that support responsible and sustainable agricultural practices while also addressing the risks associated with financial speculation in commodity markets. The dual nature of financialization is evident in the potential benefits, such as improved market efficiency, increased liquidity and heightened foreign investment in the agricultural sector, alongside the risks associated with speculative behavior that can result in significant price fluctuations and market distortions. Policymakers are faced with the challenge of navigating this delicate balance, recognizing the positive aspects of financialization while actively mitigating its potential negative consequences. Striking an equilibrium requires a nuanced approach, one that leverages the advantages of financialization without compromising the stability and integrity of

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agricultural markets. This nuanced perspective emphasizes the need for policies that foster a responsible financial environment within the agricultural sector, promoting sustainable practices and curbing excessive speculation. By adopting such measures, policymakers can contribute to the creation of a resilient and efficient agricultural system that benefits both producers and consumers.

Expanding research to encompass commodities beyond maize, soybeans and wheat—those specifically examined in this paper—would contribute to a more holistic understanding of the relationship between financialization and food security. The current study is constrained in its analysis, focusing solely on the BRICS nations of India, Russia, China, Brazil and South Africa. Broadening the scope to include additional countries in subsequent analyses would enhance the accuracy of assessing the overall impact of financialization on food security across all emerging nations. Diversifying the range of commodities studied and incorporating a more extensive set of nations could provide nuanced insights into the multifaceted dynamics between financialization and food security. Such an approach would offer a more comprehensive overview, helping policymakers, researchers and stakeholders better comprehend the broader implications and potential variations in the impact of financialization on food security in diverse geopolitical and economic contexts.

References

Aït-Youcef, C. (2019), "How index investment impacts commodities: a story about the financialization of agricultural commodities", *Economic Modelling*, Vol. 80, pp. 23-33, doi: 10.1016/j.econmod.2018.04.007.

Baffes, J. and Haniotis, T. (2010), "Placing the 2006/08 commodity price boom into perspective", World Bank Policy Research Working Paper, (5371).

Brunetti, C., Büyükşahin, B. and Harris, J.H. (2016), "Speculators, prices, and market volatility", *Journal of Financial and Quantitative Analysis*, Vol. 51 No. 5, pp. 1545-1574, doi: 10.1017/s0022109016000569.

Clapp, J. and Helleiner, E. (2012), "Troubled futures? The global food crisis and the politics of agricultural derivatives regulation", *Review of International Political Economy*, Vol. 19 No. 2, pp. 181-207, doi: 10.1080/09692290.2010.514528.

Clapp, J. and Isakson, S.R. (2018), "Risky returns: the implications of financialization in the food system", *Development and Change*, Vol. 49 No. 2, pp. 437-460, doi: 10.1111/dech.12376.

Cotula, L. (2011), *Land Deals in Africa: What is in the Contracts?*, Iied, London.

Dymski, G. and Pollin, R. (2015), "Hyman Minsky as hedgehog: the power of the wall street paradigm", in *Financial Conditions and Macroeconomic Performance*, Routledge, pp. 27-61.

Epstein, G.A. (Ed.). (2005), *Financialization and the World Economy*, Edward Elgar Publishing, Cheltenham.

Fahim, F.R. (2022), "Food security and sovereignty with relation with agri financialization", *IOSR Journal of Research and Method in Education (IOSR-JRME)*, Vol. 12 No. 6, pp. 20-24.

Fahim, F.R. and Rahman, M. (2022), "Food security and sovereignty with relation with agri financialization", *IOSR Journal of Research and Method in Education (IOSRJRME)*, Vol. 12 No. 6, pp. 20-24, doi: 10.9790/7388-1206022024.

Faria, W.R. and Almeida, A.N. (2016), "Relationship between openness to trade and deforestation: empirical evidence from the Brazilian Amazon", *Ecological Economics*, Vol. 121, pp. 85-97, doi: 10.1016/j.ecolecon.2015.11.014.

Frenk, D. (2010), "Review of Irwin and Sanders 2010 OECD Reports: Speculation and Financial Fund Activity and the Impact of Index and Swap Funds on Commodity Futures Markets", Better Markets, Washington, DC, available at: https://www.newconstructs.com/wpcontent/uploads/2010/10/FrenkPaperReutingOECDStudy_IrwinAndSanders.pdf

Downloaded from http://www.emerald.com/jadee/article-pdf/15/5/936/10344675/jadee-06-2023-0147en.pdf by Institut Latihan Statistik Malaysia user on 02 December 2025

Gheit, F. (2008), "Testimony before the subcommittee on oversight and investigations of the committee on energy and commerce, US house of representatives", Internet Site, available at: http://energycommerce.house.gov/cmte_mtgs/110-oi-hrg,62308

Gilbert, C.L. (2010), "How to understand high food prices", *Journal of Agricultural Economics*, Vol. 61 No. 2, pp. 398-425, doi: 10.1111/j.1477-9552.2010.00248.x.

Irwin, S. and Sanders, D. (2010), "The impact of index and swap funds on commodity futures markets: preliminary results", *OECD Food, Agriculture and Fisheries Papers*, OECD Publishing, Paris, No. 27, doi: 10.1787/5kmd40wl1t5f-en.

Irwin, S.H. and Sanders, D.R. (2011), "Index funds, financialization, and commodity futures markets", *Applied Economic Perspectives and Policy*, Vol. 33 No. 1, pp. 1-31, doi: 10.1093/aepp/ppq032.

Krippner, G.R. (2005), "The financialization of the American Economy", *Socio-economic Review*, Vol. 3 No. 2, pp. 173-208, doi: 10.1093/ser/mwi008.

Kuns, B., Visser, O. and Wästfelt, A. (2016), "The stock market and the steppe: the challenges faced by stock-market financed, Nordic farming ventures in Russia and Ukraine", *Journal of Rural Studies*, Vol. 45, pp. 199-217, doi: 10.1016/j.jrurstud.2016.03.009.

Lizé, S. (2019), *Financialization of Rice in Vietnam: Lessons from the Coffee Market*, available at: https://ssrn.com/abstract=3458439 or http://dx.doi.org/10.2139/ssrn.3458439

Manogna, R.L. (2021a), "Innovation and firm growth in agricultural inputs industry: empirical evidence from India", *Journal of Agribusiness in Developing and Emerging Economies*, Vol. 11 No. 5, pp. 506-519, doi: 10.1108/JADEE-07-2020-0156.

Manogna, R.L. (2021b), "Ownership structure and corporate social responsibility in India: empirical investigation of an emerging market", *Review of International Business and Strategy*, Vol. 31 No. 4, pp. 540-555, doi: 10.1108/RIBS-07-2020-0077.

Manogna, R.L. and Anand, A. (2023), "A bibliometric analysis on the application of deep learning in finance: status, development, and future directions", *Kybernetes*, Vol. ahead-of-print No. ahead-of-print, doi: 10.1108/K-04-2023-0637.

Manogna, R.L. and Mishra, A.K. (2020), "Price discovery and volatility spillover: an empirical evidence from spot and futures agricultural commodity markets in India", *Journal of Agribusiness in Developing and Emerging Economies*, Vol. 10 No. 4, pp. 447-473, doi: 10.1108/JADEE-10-2019-0175.

Manogna, R.L. and Mishra, A.K. (2021a), "Forecasting spot prices of agricultural commodities in India: application of deep-learning models", *Intelligent Systems in Accounting, Finance and Management*, Vol. 28 No. 1, pp. 72-83, doi: 10.1002/isaf.1487.

Manogna, R.L. and Mishra, A.K. (2021b), "Does investment in innovation impact firm performance in emerging economies? An empirical investigation of the Indian food and agricultural manufacturing industry", *International Journal of Innovation Science*, Vol. 13 No. 2, pp. 233-248, doi: 10.1108/IJIS-07-2020-0104.

Manogna, R.L. and Mishra, A.K. (2021c), "Exploring the role of family ownership in internationalization: empirical investigation of Indian firms", *Review of International Business and Strategy*, Vol. 31 No. 1, pp. 1-15, doi: 10.1108/RIBS-05-2020-0058.

Manogna, R.L. and Mishra, A.K. (2022a), "Measuring financial performance of Indian manufacturing firms: application of decision tree algorithms", *Measuring Business Excellence*, Vol. 26 No. 3, pp. 288-307, doi: 10.1108/MBE-05-2020-0073.

Manogna, R.L. and Mishra, A.K. (2022b), "Financialization of Indian agricultural commodities: the case of index investments", *International Journal of Social Economics*, Vol. 49 No. 1, pp. 73-96, doi: 10.1108/IJSE-05-2021-0254.

Manogna, R.L. and Mishra, A.K. (2022c), "Agricultural production efficiency of Indian states: evidence from data envelopment analysis", *International Journal of Finance and Economics*, Vol. 27 No. 4, pp. 4244-4255, doi: 10.1002/ijfe.2369.

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Manogna, R.L. and Mishra, A.K. (2023), "Market efficiency and price risk management of agricultural commodity prices in India", *Journal of Modelling in Management*, Vol. 18 No. 1, pp. 190-211, doi: 10.1108/JM2-04-2021-0104.

Manogna, R.L. and Nishil, K. (2024), "Does the financialization of agricultural commodities impact food security? An empirical investigation", *Borsa Istanbul Review*. ISSN: 2214-8450, doi: 10.1016/j.bir.2024.01.001.

Manogna, R.L., Mishra, A.K. and Sinha, A.K. (2021), "Does institutional ownership affect firms' international investments? Empirical evidence from India", *Journal of Strategy and Management*, Vol. 14 No. 1, pp. 50-63, doi: 10.1108/JSMA-12-2019-0210.

Manogna, R.L., Kulkarni, N. and Akshay Krishna, D. (2024), "Food security and financialization of agricultural commodities: impacts and the potential for adaptation in emerging economies", *International Journal of Emerging Markets*. doi: 10.1108/IJOEM-06-2023-0954.

Masters, M.W. (2008), *Testimony before the Committee on Homeland Security and Government Affairs*, US Senate.

Narsimhulu, S. and Satyanarayana, S.V. (2016), "Efficiency of commodity futures in price discovery and risk management: an empirical study of agricultural commodities in India", *Indian Journal Robles of Finance*, Vol. 10 No. 10, pp. 7-26, doi: 10.17010/ijf/2016/v10i10/102990.

Ouyang, R. and Zhang, X. (2020), "Financialization of agricultural commodities: evidence from China", *Economic Modelling*, Vol. 85, pp. 381-389, doi: 10.1016/j.econmod.2019.11.009.

Prager, D., Burns, C., Tulman, S. and MacDonald, J. (2020), *Farm Use of Futures, Options, and Marketing Contracts*, No. 1473-2020-854, doi: 10.22004/ag.econ.305690.

Robles, M., Torero, M. and Von Braun, J. (2009), *When Speculation Matters*, No. 592-2016-39916.

RTFC and CES (2022), "Hunger watch report", in *Right to Food Campaign and Centre for Equity Studies*.

Schaffnit-Chatterjee, C., Schneider, S., Peter, M. and Mayer, T. (2010), *Risk Management in Agriculture*, Deutsche Bank Research, Frankfurt, pp. 3-29.

Srinivasan, S. (2008), *Futures Trading in Agricultural Commodities*, available at: https://ssrn.com/abstract=1197602 or http://dx.doi.org/10.2139/ssrn.1197602

Stockhammer, E. (2010), "Financialization and the global economy", *Political Economy Research Institute Working Paper*, Vol. 242 No. 40, pp. 1-17.

Tang, K. and Xiong, W. (2012), "Index investment and the financialization of commodities", *Financial Analysts Journal*, Vol. 68 No. 6, pp. 54-74, doi: 10.2469/faj.v68.n6.5.

Tujan, A. Jr and Director, I.B.O.N. (2013), *UNCTAD Public Symposium*, 24-25 June, 2013.

Vercammen, J. and Doroudian, A. (2014), "Portfolio speculation and commodity price volatility in a stochastic storage model", *American Journal of Agricultural Economics*, Vol. 96 No. 2, pp. 517-532, doi: 10.1093/ajae/aat098.

Vijayabaskar, M. and Menon, A. (2018), "Dispossession by neglect: agricultural land sales in Southern India", *Journal of Agrarian Change*, Vol. 18 No. 3, pp. 571-587, doi: 10.1111/joac.12256.

Visser, O. (2015), "Finance and the global land rush: understanding the growing role of investment funds in land deals and large-scale farming", *Canadian Food Studies*, Vol. 2 No. 2, pp. 278-286, doi: 10.15353/cfs-rcea.v2i2.122.

World Food Summit (1996), Food and Agriculture Organization.

World Health Organization (2020), *The State of Food Security and Nutrition in the World 2020: Transforming Food Systems for Affordable Healthy Diets (Vol. 2020)*, Food and Agriculture Org, Rome.

Zalewski, D.A. and Whalen, C.J. (2010), "Financialization and income inequality: a post Keynesian institutionalist analysis", *Journal of Economic Issues*, Vol. 44 No. 3, pp. 757-777, doi: 10.2753/jei0021-3624440309.

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Gorton, G. and Rouwenhorst, K.G. (2006), "Facts and fantasies about commodity futures", *Financial Analysts Journal*, Vol. 62 No. 2, pp. 47-68, doi: 10.2469/faj.v62.n2.4083.

Jamora, N., Valera, H.G., Matriz, M.J., Molina, I. and Mohanty, S. (2010), "The role of exchange rates and domestic policies on global rice food security", No. 320-2016-10062, doi: 10.22004/ag.econ.61681, available at: https://ageconsearch.umn.edu/record/61681

Ogundari, K. and Awokuse, T. (2016), "Assessing the Contribution of agricultural productivity to food security levels in sub-Saharan African countries", No. 333-2016-14383, pp. 2-26, doi: 10.22004/ag.econ.235730, available at: https://ageconsearch.umn.edu/record/235730

Ponte, S. and Gibbon, P. (2005), "Quality standards, conventions and the governance of global value chains", *Economy and Society*, Vol. 34 No. 1, pp. 1-31, doi: 10.1080/0308514042000329315.

Shaw, D.J. (2007), *World Food Summit, 1996. 'In World Food Security: A History since 1945 (pp. 347-360)'*, Palgrave Macmillan, London.

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