The Crop with No Futures: Explaining the Absence of Derivatives Trading in the Rice Market[1]

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Available at Edinburgh Research Archive: https://era.ed.ac.uk/handle/1842/37966

This research explores the reasons behind the low financial development (materialized by the use of derivatives trading) of the rice market, unique within the realm of large commodity markets. Through a comparison with crops with highly liquid futures markets (coffee, sugar and wheat), this article argues that the low financial development of rice is not due to one impeding factor but the accumulation of many instead. Of these, the most prominent are the disincentives for the participation of financially sophisticated actors, and the politicization of rice. I argue that both factors find their root in the geographical organization of the market, which is highly concentrated in developing economies.

Introduction

Derivative finance finds its roots in the rice bills traded in the streets of 17th century Osaka before expanding to Tokyo and the Southeast Asian rice markets under colonial rule. These markets arguably served as models for the rise of futures contracts for agricultural crops in Chicago at the end of the 1870s. However, while commodity exchanges continued growing in the 20th century, listing contracts for all sorts of agricultural crops, the rice market never managed to rebuild its futures trading that had been disrupted by WWII. While futures for other grains or soft commodities grow ever more liquid, sparking debates on the impact of this financialization, rice – the largest value agricultural market (FAO, 2019) – remains stagnant in its state of financial underdevelopment (see Figure 1 below). A small contract in Chicago meant to hedge the rice from the southern states and a few failures at establishing an international contract has led the financial industry to assume that rice simply does not fit into the mechanisms of futures trading. This article aims to go beyond that postulate by answering the following research question: *what explains the fact that financial development characterizes most food markets but has remained marginal in the rice market?*

In this article, *financial development* is defined as the measure and process of the increasing ability to trade (price) risk. It is the product of two variables: the financial sophistication of the market structure, that is, the availability of financial instruments to trade this risk; and the financial sophistication of market actors, that is, their individual technical ability to trade risk (Hardie, 2012; Rajan, 2006). The financial development of a commodity market is therefore mostly manifested in the liquidity of futures contracts and over-the-counter (OTC) derivatives for that commodity. The research question, therefore, implies researching the lack of liquid derivative instruments for rice.

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Relevance of the Research Question

The present research has relevance for both practitioners and academics alike. Firstly, the research question has animated debates within the rice industry for decades, but the prevailing secrecy in the market has limited its ability to collectively provide an answer. Academic research, therefore, can potentially diagnose the market dynamics that have led to financial underdevelopment. Although the research itself aimed to avoid the contentious topic of the pros and cons of futures trading for market participants to focus on an objective analysis of the research question, many industry stakeholders believe that the lack of futures trading weighs heavily on producers. For instance, the impossibility to sell forward is acknowledged as an important obstacle for growers to obtain bank loans. The absence of a publicly discovered price deriving from (deeply liquid) futures trading also enables information asymmetry that disadvantages farmers when negotiating prices. This issue becomes even more relevant once the importance of the rice market is acknowledged: rice is the food staple of half of the world's population and is often believed to be the biggest employing industry globally, with an estimated 1 billion households depending on it for their livelihood (Diouf, 2003).

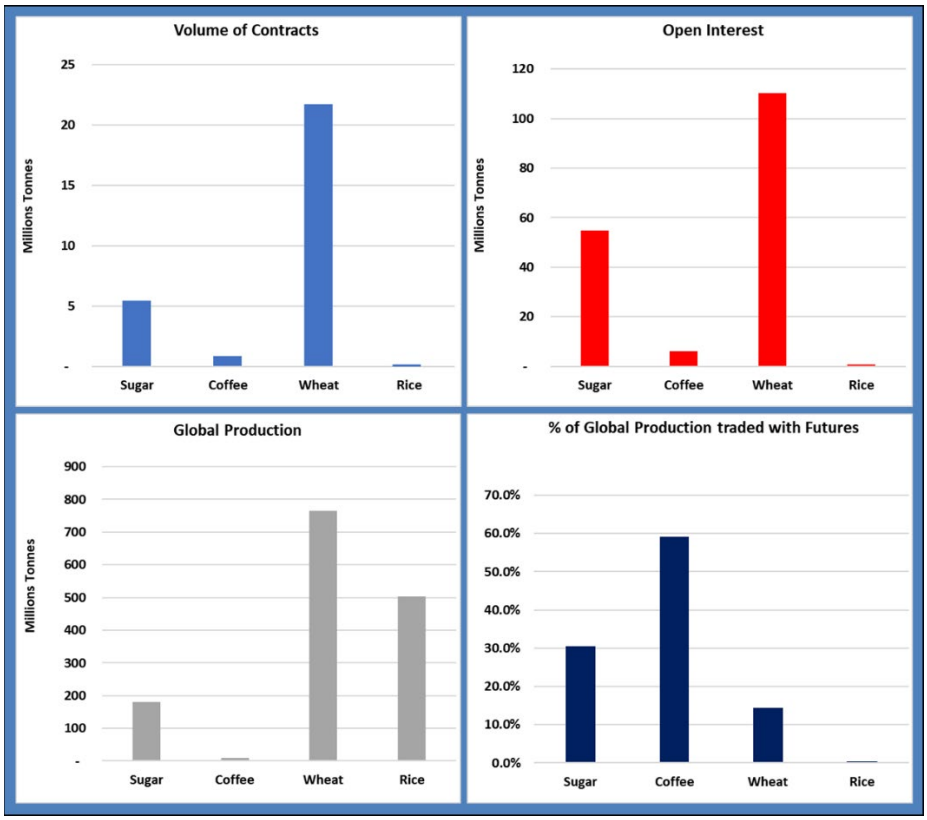
Secondly, rice can serve as a case study to enhance the understanding of the mechanisms involved in the financial development of commodities. The research presents a valuable contribution to the academic theory on the topic. For instance, the research advances the debate about which major factors contribute to the success or failure of futures contracts. The study of rice also allows building an understanding of financial development specific to the context of developing countries, for which the existing literature remains narrow. By answering the research question, this article is also able to provide a new theory of financial markets development that awards importance to the geographical chronology of the process.

Data and Methodology

The research primarily uses a comparative study between the case of rice and three financially developed crop markets: coffee, wheat and sugar. Since the research question is derived from the observation of the fundamental anomaly of the rice market regarding financial development, the research inevitably had to be articulated around a comparative method. The strategy was to identify hypotheses for what could cause the anomalies and singularities of market development in rice. When the factors hypothesized to prevent financial development were confirmed to be features of the rice market, they were then explored within the compared market to analyze whether they were indeed hindering variables. If these were featured in other markets, it meant that they could not be standalone reasons for the lack of financial development of rice, although I explored their potential to be at least limiting factors. The research analyzes extensively both the empirical reasons for the failure of past futures contracts for rice and the theoretical ability for the rice market to develop financially.

Figure 1

The Volumes Traded for Selected Futures Contracts[2] on the 30th of April 2021 vs. 2019 Global Production[3]



As I hypothesized that the geography of the rice market, its lack of integration and preponderance in developing countries is key to its lack of financial development, the analysis needed to be grounded in a set of geographical case studies: the USA, Thailand and Vietnam as main areas of research, while the case of Japan allowed exploring more specific problems such as politicization. While the case of the USA illustrated the difficulty of rice to develop futures contracts even in the context of a financially highly developed economy, the cases of Thailand and Vietnam allowed for the study of the relationship between economic development and the financial development of a commodity.

The main body of the research is qualitative and based on the interviews of 46 market stakeholders during 41 interviews, carried out between July 2017 and November 2019. All the participants were involved or formerly involved in commodity markets, whether in the physical supply chain, in the finance industry or as research analysts. These interviews allowed for the collection of a vast amount of data from a large number of market actors that were either key stakeholders in the process of financial development, or representative of their respective interest groups. The interview process also allowed the anonymous disclosure of information that would not exist in written documents or be found in the academic literature as the rice industry is a secretive one. This also implies that the common knowledge of the market is highly fragmented between participants, and this research aimed at gathering and reconciling the informational knowledge of the industry.

Key Findings

The research challenges the common argument of the existing literature that a single factor[4] is enough to disrupt the financial development of a commodity market (Gray, 1966; Carlton, 1984; Sandor, 1973; Silber, 1981). Instead, based on the experience of the compared markets, it argues that the believed impeding factors are variables that only limit such financial development. In the case of rice, however, the accumulation of impeding factors to the establishment of futures contracts prevented the financial development of the crop.

Before detailing which factors have disrupted financial development, it is important to state that the analysis of the failure of past futures contracts for rice has revealed that they were often primarily the result of *ad hoc* issues such as mistakes in the design of the contract or mismanagement of the exchange hosting the contract. They, therefore, left the rice market with an unsophisticated market structure but did not prove the impossibility to see rice develop financially. Instead, it is the analysis of the market organization that allowed us to resolve the research issue.

The overall research paper, which this article summarizes, finds that rice market actors have a low propensity to participate in derivative trading, which deprives newly created futures contracts of the liquidity they need to grow and attract speculators. It is however important to notice that this low propensity to trade risk is due to reasons varying between actors. The first reason is the low financial sophistication of many physical market actors, including farmers. That issue is not unique to the rice market, but it is compensated in other industries by the advanced sophistication of intermediaries such as brokers and millers, which is not common in rice. The question remains as to why sophisticated actors, who could play a key role in the building of a futures market, are reluctant to do so. A first group is made of producers, such as some of the ones located in Louisiana, with the resources and knowledge to use derivatives but with a risk profile counter-incentivizing them to do so. The storable nature of rice means that they can keep the crop on-farm long after the harvest, waiting for a rally in prices instead of being price takers at harvest time. By doing so, they hedge physically, removing the need for a financial hedge. Secondly, they perceive their crop risk to be greater than their price risk and fear that by locking in prices early in the crop season, they expose themselves to further crop risk.

The second group is made of larger participants down the supply chain such as millers, traders and exporters, as well as farming cooperatives. These actors intentionally avoid participating in the building of derivative markets due to the potential erosion of their market power resulting from futures contracts. Such power can be the result of the profile of the supply chain, but its most important driver is the opacity of the rice market. These actors can go beyond the simple fact of not participating and actively sabotage futures contracts by lobbying governments to suppress derivative exchanges. All traders and importers are not reluctant to use futures trading, but the minority of those wishing to trade risk find themselves too few and therefore deprived of a counterpart to trade risk with. This implies that sophisticated actors of the rice market have less ability to promote the development of futures trading than to disrupt it.

The issue of a lack of potential participants in derivatives trading from the physical market brings us to the other major argument of this article: that the geography of the rice market is unconducive to its financial development. Unlike compared markets where developed nations are involved in international trade as

either producers or consumers, rice remains a grain traded mostly within and between countries of the Global South (see Table 1). The comprehensive version of this article argues that the compared crops have developed financially because they had terminal markets based in the West or Eastern Asia, but that rice cannot go through the same development at the local level in developing countries. The commonality of small-scale farming and small trading entities in the Global South, for instance, reduces the number of financially sophisticated actors. The weakness of contract law in some developing countries can also be an obstacle to financial development as it can prevent the extension of OTC markets that create a link between the least sophisticated actors and futures markets. Drawing on the literature on the lack of agricultural data in developing countries (Perloff and Rausser, 1983; Barrett and Mutambatsere, 2008; Deichmann, Goyal, and Mishra, 2016), I also argue that this opacity creates a high degree of information asymmetry favoring larger traders and cooperatives. This is the source of the market power that these "unwilling financially sophisticated actors" are looking to protect.

Table 1

The Top 10 Producing, Consuming, Exporting and Importing Countries of Rice (in 1000's of metric tonnes)

	Producer		Consumer		Exporter		Importer	
1	China	*142,274*	China	*143,553*	India	*11,202*	China	*3,170*
2	India	*115,805*	India	*101,271*	Thailand	*10,095*	Philippines	*1,747*
3	Indonesia	*38,516*	Indonesia	*36,433*	Viet Nam	*4,727*	Benin	*1,727*
4	Bangladesh	*36,274*	Bangladesh	*35,367*	Pakistan	*4,059*	Iran	*1,444*
5	Viet Nam	*28,961*	Vietnam	*21,317*	USA	*3,552*	Côte d'Ivoire	*1,394*
6	Thailand	*20,811*	Philippines	*13,883*	Myanmar	*2,471*	Saudi Arabia	*1,272*
7	Myanmar	*17,873*	Thailand	*11,700*	China	*2,011*	Senegal	*1,119*
8	Philippines	*12,708*	Myanmar	*10,283*	Brazil	*1,049*	Iraq	*1,081*
9	Brazil	*7,702*	Japan	*8,450*	Uruguay	*931*	South Africa	*1,039*
10	Pakistan	*7,358*	Brazil	*7,433*	Italy	*716*	Indonesia	*1,001*

Another argument already existed in the literature but lacked substantial research: that the politicization of the market can impede financial development (Pochara, 2012; McKenzie, 2012; Hamilton, 2012; Carter, 2007). The thesis, upon which this article is based, argues that politicization is not unique to rice, but the nature of this politicization *is*. Indeed, the rice market, due to its double role as a staple food for consumers and a livelihood for producers within the same political space, is exceptionally politically salient. The political salience of the crop is another product of the prominence of the Global South in its geography as food expenses represent a larger share of household expenses in developing countries, while high levels of employment in agriculture imply that farmers hold collectively more political power (Gulati and Narayanan, 2003; Shigetomi, 2011; Clarete, Adriano, and Esteban, 2013). In the compared markets, political interventions have taken place at the international level with the effect of reducing volatility in the long run. In rice, it has more often taken place at the national level as rice policies can affect election results, creating high levels of political uncertainty (instead of stability) which has become the main source of risk in this market. The difficulty, if not impossibility, in modelling this political risk has deprived derivatives markets for rice from the participation of speculators. In addition, the growing amount of rice

being traded internationally means that political shocks are increasingly transmitted between national rice markets.

Finally, the overall article confirms another assumption of the literature (Roche, 1992; Latham, 1998): that the fragmented nature of the market into many varieties prevents the creation of benchmarks. I argue that it can be more accurate to talk about rice markets than a single rice market. However, I argue that the financial development of these separate segments of the rice market is not theoretically impossible. As a result, the fragmentation of the global rice market is not a standalone explanation for the absence of futures contracts.

Implications and Conclusion

The case of rice carries a lot of lessons for the study of commodity finance. The first one is that financial development cannot be seen as in any way inevitable, whether in a developed economy or even more in a developing one. Instead, the building of derivatives markets is a slow process heavily influenced by domestic conditions; it needs a set of favorable conditions to take root. The increase in the sophistication of market actors is a long-term process, while the sophistication of the market structure can take several attempts before being successful.

Secondly, the financial development of commodities is a process exogenous to developing economies. The literature already argues that developing and transition economies are not conducive to the development of derivatives markets (Fernandez, 2003; Shamsher and Taufiq, 2008; Kuzman, Ercegovac, and Momčilović, 2018). While this argument is supported by the case of rice, coffee and sugar show that financial development can still take place in the domestic markets of developing countries. However, it does so through an expansion of the financial development of global markets, initiated in the Global North, into the domestic markets of developing countries.

Finally, the case of rice confirms the argument in Hardie (2012) that the financial sophistication of an actor does not correlate with this agent's likeliness to pursue the financialization of the market structure. It correlates with their exposure to price risk and negatively correlates to the threat that futures trading represents to their market power instead. If a sophisticated actor is not supportive of financial development, then its ability to sabotage also becomes key to the success prospects of a contract. Additionally, the presence of willing sophisticated actors in a commodity market is not sufficient to launch a futures contract. Their number is also critical to assemble enough trading counterparts to generate liquidity. To make a derivatives transaction succeed, there must be two willing actors. To make a derivatives transaction fail, one is enough.

Endnotes

1 This research digest article is based on the author's 2021 doctoral thesis in International Development at the University of Edinburgh. As such, the article has been written in the author's personal capacity. The views and opinions expressed herein do not necessarily reflect the positions of the author's current organizations.

2 Major futures contracts for each crop have been compiled and expressed in Metric Tonnes, depending on the contract size. These contracts are the ICE Sugar No. 5, No. 11 and No. 16 for sugar; ICE Coffee C and Robusta contracts for coffee; CME Chicago, Kansas City and Black Sea Wheat as well as Euronext Milling Wheat for wheat, and CME Rough Rice contract for rice.

3 Production data from the U.S. Department of Agriculture; futures data from Barchart.

4 These include lack of volatility, the size of the cash market, the lack of homogeneity or storability of the crop and prices not being freely determined.

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Keywords

Commodity market, financial development, futures contracts, rice market.

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