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Contagion and transfer relationships between financial instruments and the spot price of Mexican yellow corn, 2002-2020

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Abstract

This research presents an analysis of the connection between the prices and quotes of different financial instruments in the context of financialization processes. To this end, a series of autoregressive vectors and error correction vectors (VAR/VEC) models were developed with the spot price of Mexican yellow corn, the Chicago Board of Trade (CBOT) yellow corn futures, the price of the Commodity Index (CRB), the Dow Jones Industrial Average (DJIA) and the U.S. money supply (M1). The objective was to identify speculative activity, contagion effects and price transfer between different industries in the context of the changes in the acquisition target of financial instruments, from the approach proposed by Wray (2008) on speculative bubbles in commodities and the guarantee of stability between the agricultural and financial sector (Penone, et al., 2022). We conclude the presence of causal relationships between the variables and the presence of two interconnected systems through the U.S. money supply.

JEL Classification: C22, G15, D84, Q11
Keywords: Futures Market, Finances, Speculation, Financialization

Contagio y transferencia; relaciones entre instrumentos financieros y el precio spot del maíz amarillo mexicano, 2002-2020

Resumen

En esta investigación se analiza la vinculación entre los precios y cotizaciones de diferentes instrumentos financieros en el contexto del proceso de financiarización. Para ello se desarrollan una series de modelos de vectores autorregresivos y de vectores de corrección de error (VAR/VEC) con el precio spot del maíz amarillo mexicano, los futuros del maíz amarillo de la Chicago Board of Trade (CBOT), el precio del Commodity Index (CRB), el Dow Jones Industrial Average (DJIA) y la oferta monetaria estadounidense (M1). El objetivo fue identificar la actividad especulativa, los efectos de contagio y la transferencia de precios entre diferentes industrias en el contexto de cambios en el objetivo de adquisición de instrumentos financieros, desde el enfoque propuesto por Wray (2008) sobre las burbujas especulativas en materias primas y la garantía de estabilidad entre el sector agrícola y financiero (Penone, et al., 2022). Se concluye la presencia de relaciones de causalidad entre las variables y la presencia de dos sistemas interconectados a través de la oferta monetaria estadounidense.

Clasificación JEL: C22, G15, D84, Q11
Palabras clave: Mercados de futuros, Finanzas, Especulación, Financiarización.

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1. Introduction

The specific production characteristics of the agricultural industry requires of the banking system, either to guarantee its recapitalization or to reduce the risk of price volatility. Mechanisms to achieve both objectives using financial instruments have been in place since the end of the 19th century (CME, 2023). In recent decades, as a result of the nature developed by the current stage of the system, the exponential growth in the relationship between the financial and commodity markets has been strengthened by changes in the acquisition target and the mechanisms for the use of such instruments.

It is noted that since there is a direct correlation between spot prices and futures prices in the agricultural sector, stability in the relationship between futures prices is very relevant (Penone, Giampetri and Trestini, 2022; Liao and Li, 2025) since the imbalance and prioritization of speculative activities over the aim of guaranteeing stability in spot prices through risk transfer would mean that agents in the financial sector would benefit from the process of extracting profits from the agricultural sector.

On this premise, the structure of the paper is organized in four sections: the first section discusses the financialization process and the changes in the objective of acquiring financial instruments; the second section describes the context of the relationship between the corn and financial markets; the third section discusses the methodological aspects and data description; the fourth section presents the analysis of the results of the proposed empirical analysis; and, a series of conclusions are finally drawn.

1.- The process of financialization and the changes in the acquisition target of financial instruments For at least forty years, various theoretical currents have proposed the existence of qualitative changes in the structure of the system. One of these fundamental changes leading to think of a new capitalist regime or phase is the one driven by finance, whose main attribute is a process roughly called financialization (Guttmann, 2009; Soto, 2014; Lapavitsas, 2016; Durand, 2018). This change points out, in general terms, the existence of a contradiction in the current economic dynamics between two segments of capital: the productive one and the financial one (Mateo, 2015).

In this regard, the process of financialization corresponds to the context of financial globalization that led to transformations in the financial systems as a result of the deregulation and led to the dominance of finances over the productive economy, which made the use of derivative instruments in composite portfolios for risk diversification possible. This catapulted speculative capital holdings, enabling their expansion into physical markets, and particularly commodity markets (Rubio, 2010; Soto, 2010, 2014; Durand, 2018).

In contextual terms, the relation between the use of derivatives and the presence of crises has gained relevance, a situation that was exposed worldwide between 2007 and 2011, when the birth of the financialization process was formally recorded, specifically in the commodities sectors, notably those of oil and basic grains (Rubio, 2011; Yin and Cao, 2024; Levent et al., 2025). There are positions that identify that in the process of commodity financialization, shareholder value has been prioritized over productive value, since financial deregulation resulted, among other things, in the prices of financial and non-financial assets being determined in the derivatives market, which ended

up altering prices in the spot market and whose observable consequence is the levels of volatility in agricultural prices (Soto, 2014; Szturo et al., 2024; Ibrahim and Elamer, 2024).

The process of financialization has been a key factor in the problem of rising commodity prices linked to movements in financial markets, and although there are more elements for analysis, it remains evident that financialization is key to understanding the problem (Wray, 2008), characterized by the fact that futures stocks can be placed at levels that do not correspond to productive results, which can lead to significant changes in accounting concepts, valuation processes and the formulation of results and balance sheets. This suggests that corporate accounting has been restructured on the logic of financialization of the economy (Soto, 2014; Szturo, et al., 2024).

On this note, some authors propose the study of the connection between financialization and commodity relationships and how this connection between various prices cannot be explained by macroeconomic fundamentals alone (Pinkdyck and Rotemberg, 1990, Diebold and Yilmaz, 2012, 2014; Prosad and Sinha, 2017; Liu and Zhang, 2019). Along the same idea but from a different perspective, we also point out that the recent volatility and increase in the cost of basic grains has been due to speculative capital flows rather than to changes in food supply and demand (Correa et al., 2017).

As a result of the changes in the composition of commodity market participants attracted by the diversification of investment returns, there have been dramatic increases in the number of participants traditionally concentrated in the financial market. Through the ongoing process of financialization, the broadest category of commodities has become a trending investment style for institutional investors, from trend-based portfolio allocations and the connection of individual commodities that are not sustained by market fundamentals. Herd behaviors of financial investors are thus observed, in particular during relevant turbulent times (Liu and Zhang, 2019).

Speculation in this regard has been fundamental in explaining the growth of the financial sector and of derivatives markets in particular, since derivative products have the potential to modify the relative prices of financial and non-financial assets, as well as to propitiate and nurture the formation of speculative bubbles that would result in the generation of waves of financial inflation, instability, and crises (Soto, 2010). From this perspective, we do not speak of convergence, but of price formation in which there is a causal relationship between the futures market and the spot market, in addition to the existence of a series of factors that influence their formation, such as: natural disruptions, market manipulation, supply and demand, political and social factors, volatility in financial variables and speculation, among others (Wray, 2008).

Thus, it appears that the direction of the causal relationship is that future prices influence spot prices, and that price speculation is a fundamental factor in their determination, since the value of the contracts is generally above the value of real production and because they anticipate the behavior of the agents and therefore of prices. Building on this notion, the process of financialization would affect the process of information discovery in commodity markets due to information fictions in the global supply, demand and inventory of commodities. Centralized futures markets commonly complement spot markets in information discovery, namely, some commodity futures prices function as barometers of the economy in recent years (Cheng and Xiong, 2014; Fijorek et al., 2021).

There is no denying that the use of futures financial instruments has a number of advantages, specifically related to risk transfer and price discovery and pricing (Adams and Gluck, 2015). Futures contracts in this sense have historically been used to transfer the risk of price volatility inherent to

the characteristics of agricultural products to speculators (Shapiro and Brorsen, 1988). In addition, there is the advantage of futures' ability to underpin prices by condensing information from the physical markets being referenced, thus helping to set spot prices. However, the widespread use of derivative instruments on agricultural commodities remains controversial as at the center of the debate lies one of the most feared effects for at least three decades: the impact that the financial sector may have on food production and prices, the possibility of food crises and the loss of sovereignty over pricing (Correa et al., 2017).

2. The connection between the corn market and the financial market.

A counter-analysis of the financial system to the agricultural market, specifically to grains, with emphasis on corn, was proposed for several reasons. These include the fact that, being a crop sensitive to financial movements, it has the capacity to be a thermometer product of the sector, in addition to being identified as an important product that, together with other underlying products, plays a guiding role in the process of transmission and price fixing between the commodity derivatives stock exchanges and the physical products to which they refer.

As historical context, prior to the opening of trade in 1994, the federal government used a stock price guarantee on corn as one of the mechanisms to promote its agricultural policies. This type of fixed pricing used to be below international prices, was based on the highest price during harvest and was set by the federal government, taking into account negotiations with producers' chambers (SIAP, 2004). Subsequently, as international trade in the grain increased, producers' income was affected due to market saturation resulting from the import of foreign corn at harvest time (Ochoa, 2011), turning Mexico into a net corn importer by 1973, even though it was reported to be the second largest corn producer in Latin America and the Caribbean (SIAP, 2004).

Prices tended to fluctuate, therefore, the largest corn producers, located mainly in Sinaloa, Jalisco, State of Mexico, Michoacán and Guanajuato (ASERCA, 2019), were affected and sought alternatives that would allow them to lessen the risk. One of the first measures adopted was the elimination of guaranteed prices for corn and the acceleration of a reform process of the Mexican agricultural market (SIAP, 2004), in this way, the outline for obtaining futures on agricultural products was proposed based on the listing of corn futures contracts on the Chicago Mercantile Exchange Group (CME Group), through Fideicomisos Instituidos con Relación a la Agricultura (FIRA) who acted as the government's financial agent to perform the functions of using hedging contracts for the price of various agricultural products (ASERCA, 2019).

The purpose of this program was to function as an insurance policy and the form of acquiring coverage was under the supervision of the Secretary of Agriculture, Livestock, Rural Development, Fisheries and Food (SAGARPA in Spanish). Subsequently, this function would be carried out by the Agricultural Marketing and Market Development Services Agency (ASERCA in Spanish), a program established in 1991 as an Decentralized Administrative Body of the then Ministry of Agriculture and Hydraulic Resources (SARH in Spanish), to act as a body through which to promote the commercialization of the sector's production in view of the liberalization of trade (ASERCA, 2017),

as well as to lessen the negative effects of the process of financialization of the sector that was expected due to the implementation of risk hedges in Mexican agriculture.

A series of events, such as the liberalization of Mexican finances in 1986, as well as the public-private partnership in agricultural production made possible by the 1992 agrarian reform, allowed SAGARPA to authorize the sale of futures on Mexican agricultural commodities as of 1993. This program began with the use of a price hedging system that emerged by 1993, originally exclusively to cover the fall in cotton prices and later to hedge the price of corn (Ortiz and Montiel, 2016).

Subsequently, as a result of the 1994-1995 crisis in Mexico, corn production was severely affected partly by the cyclical effect of demand and also by climatic factors (Basurto and Escalante, 2012). Therefore, the State maintained the subsidy on the price of corn and a controlled price regime through the National Company of Popular (CONASUPO in Spanish) until 1996. As of this year, the program began to be used for the acquisition of stock instruments in the CBOT mostly by producers of white corn, the underlying product being US#2 quality yellow corn (Ortiz and Montiel, 2016).

Later, as a result of the 2008 financial crisis, in global terms, the decline of the domestic market in Latin American economies led to lags in the consumption of agricultural products and with it a loss of income for producers, which ultimately limited their financing power (Rubio, 2011). During this process, corn prices also increased as a result of the increase in ethanol production, which created great uncertainty that drew speculative capital to buy and sell assets regarding Mexican corn (Rubio, 2011; Correa, et al. 2017). In 2012, coinciding with the time when Mexico ranked fourth in corn production in the world (SIAP, 2004), the Mexican Derivatives Exchange called the Mexican Derivatives Market (MexDer in Spanish) was established, in which SAGARPA presented the first yellow corn futures contract in Mexico to be traded among producers, traders, industrialists and financial investors in the agricultural sector (SAGARPA, 2012).

In terms of production, since 2016, it was identified that 54% of Mexican corn in Mexico was destined for livestock use, 36% was destined for the starch sector, 6% for the production of flour and the remaining 2% for the production of cereals and snacks, respectively (Deere, 2016); by 2019 of the 8 million hectares of corn produced, 6 million belonged to low productivity corn and 2 million corresponded to hybrid seeds; of these, 88% of production was white corn and 11% consisted of yellow corn and the remaining 1% of other varieties (Lamsa, 2019). In the specific case of yellow corn, the grain was mainly used as an input in the industrial production of balanced feed for livestock production and it was reported that national production was deficient, covering only 24% of industrial and consumption requirements, with the United States of America as the main supplier of grain, with an import of around 12.75 million tons (SAGARPA, 2017).

By 2018, yellow corn was identified as the fourth most important import product from this country to Mexico, only after gasoline, diesel and natural gas (SE, 2018). This trend did not change in the following years and imports of this product were expected to increase in the national projections made until 2030 (SAGARPA, 2017). This was confirmed when in 2021, the United States of America was identified as Mexico's main trading partner and from which it imported 48.8% of the total merchandise entering the country. (BANXICO, 2021).

These data are a sign of the growing dependence on grain imports, a problem that has been shown to be constant long-term. This not only conditions the physical grain market in Mexico, but also the appraisal of the spot price of yellow corn and its listing on the stock exchange, which in turn

determines the price of white corn since the instruments purchased as insurance to guarantee its price are based on U.S. yellow corn (Ortiz and Montiel, 2016).

In this sense, the CBOT has had a close and historical relationship with the Mexican grain market, so it is of the utmost importance to periodically analyze and monitor the relationship between spot and futures prices, as well as the incorporation of other instruments representative of certain sectors that improve the adjustment and allow for the analysis of interactions between markets.

3. Methodological aspects and description and data description

The use of VAR and VEC modeling was chosen given that the exploratory nature of the subject required the simultaneous analysis of the set of selected variables without a priori distinction as to which would be the endogenous and exogenous variables, as well as which could be considered as dependent or independent. This made it possible to analyze the interactions of the variables in turn explained by their delayed values over time, the existence or absence of causality between them through Granger causality tests, as well as Toda and Yamamoto, as appropriate.

Four models were proposed, starting with a set of simpler models that involved the two target variables PSNM and PFM, to later progress in the analysis based on the gradual incorporation of variables. Different time series and lag numbers were tested to identify those sets of models that, due to their estimation characteristics, were shown to be optimal for inference.

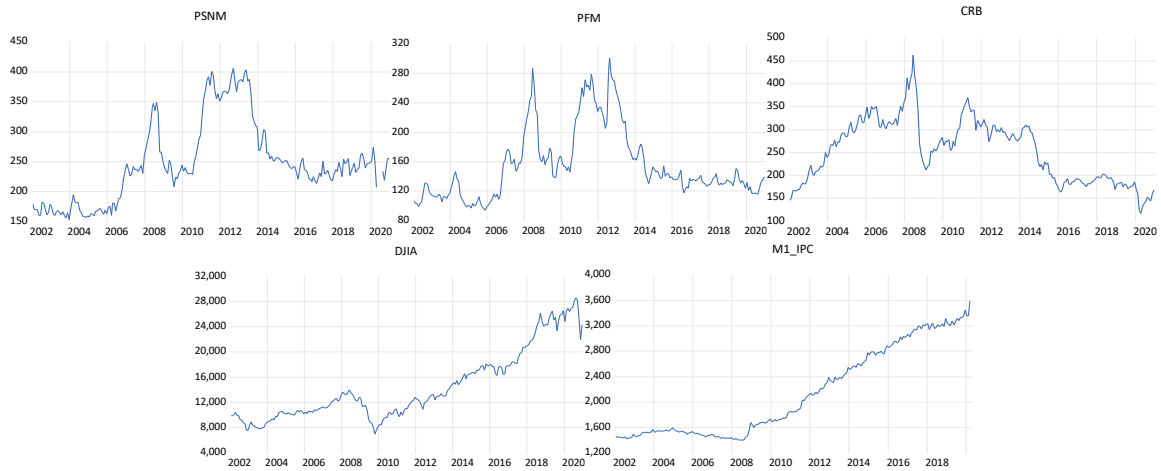
Table 1. Model definition.

VAR and VEC models	
VAR 1 VEC 1	Logarithmic spot prices and yellow corn futures 2010-2020
VAR 2	Logarithmic returns on spot and futures prices of yellow corn 2002-2020
VAR 3	Logarithmic returns on spot and futures prices of yellow corn 2002-2020. CRB and M1/IPC index, 2002-2020
VAR 4	Logarithmic returns on spot and futures prices of yellow corn, M1/IPC and DJIA index, 2005-2020

Source: Own formulation.

With regard to data, we used the series pertaining to Mexican yellow corn spot prices (PSNM), Gulf yellow corn futures prices #2 (PFM), the Commodity Index price (CRB), the Dow Jones Industrial Average price (DJIA) and the U.S. money supply (M1).

Figure 1. Graphs corresponding to the PSNM, PFM, CRB, DJIA and M1 series, 2002 to 2020.



Source: Own formulation based on FIRA (2022), SNIIM (2021), Bloomberg (2022), CBOE (2022), S&P Global (2022), FRED (2022).

The periodicity was defined as from January 2002 to March 2020 on a monthly basis, mainly due to two factors. First, the incipient development of futures instruments at the beginning of the century generated inconsistencies as well as the correspondence in the time frame between spot and futures prices in the years 2000 and 2001. Second, the lack of information due to the sanitary contingency caused by the Sars Cov 2 Coronavirus (Covid-19), which in the case of physical products meant that surveys were not carried out for the months of May, June, July and August 2020, and that in the case of future prices, data could only be consulted in the National Market Information System (SNIIM in Spanish) until February 19, 2020 (FIRA, 2022).

The definition of PSNM was based on FIRA's collection of monthly national data from Mexican yellow corn distribution centers in Mexico. Regarding PFM, the daily data collection of the contracts corresponding to the CBOT of the SNIIM was used as a baseline. Historical reports from Bloomberg's CRB, reports from S&P Global, in the S&P Dow Jones Indices division for DJIA and reports from FRED's Economic Research Division for M1 were used. Performing the Augmented Dickey Fuller (DFA), Phillips-Perron (PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) tests on the tiered data series defined the presence of unit root for almost all series. By differentiating the series it was concluded that the series were stationary on first differences I(1).

Table 1. Unit root tests.

	DFA Levels	**DFA First differences**	**PP First differences**	**KPSS First differences**
PSNM	-2.076189	-12.42207 ***	-12.35212 ***	0.114359***
PFM	-2.357637	-11.79014 ***	-11.73832 ***	0.081818**
CRB	-1.701916	-13.00133 ***	-12.84323 ***	0.212777***
DJIA	-0.134761	-14.70760 ***	-14.69411 ***	0.444597***
M1	2.182361	-5.423840 ***	-16.60543 ***	0.599417***

Source: Own formulation based on FIRA (2022), SNIIM (2021), Bloomberg (2022), CBOE (2022), S&P Global (2022), FRED (2022). Asterisks indicate coefficients are significant at 95 (**) and 99 (***) percent.

3.1. Analysis of the results

The first set of models were VAR 1 and VAR 2 grouped, which were defined as long term and short term, respectively. In VAR 1, by using variables transformed to logarithms, a VEC model was made possible, while in VAR 2 the variables are used in first logarithmic of differences, which made it possible to explain them in terms of the elasticities of the yields of both prices. Subsequently, another set of models was defined, VAR 3 and VAR 4, from which the analysis was expanded by incorporating variables corresponding to the CRB and M1 indexes for VAR 3 and the CRB, M1 and DJIA indexes for VAR 4, with the purpose of testing whether a market mainly designated as being of industrial origin, such as the DJIA, or the combination of the prices of primary energy products, agricultural products and precious and industrial metals represented by the CRB, affected the relationship between instruments. These last two models are produced with data series transformed to the logarithm of their first differences.

Table 2. Summary of validation tests to the assumptions.

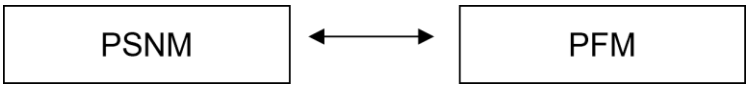
VAR 1	**Jarque-Bera**	**White**	**Rao F-Stat**	
		χ^2	lag	
	0.435871***	31,069***	1	0.226654***
			2	0.973626***
			13	0.5004**
	Johansen cointegration			
	Trace		**Eigenvalue**	
	EC(s) hypothetical value	Critical value 0.05	Ec(s) hypothetical value	Critical value 0.05
	None *	20.26184	None *	15.8921
	At least 1	9.164546***	At least 1	9.164546***
VEC 1	Error correction			
		D(LPSNM)	D(LPFM_sa)	
	Cointegration equation	-0.30384	-0.031026	
		(0.06337)	(0.06712)	
		[-4.79444]	[-0.46227]	
VAR 2	Jarque-Bera	White	Rao F-Stat	
	1.920504***	χ^2	lag	
		117.6344***	1	1.300988***
			2	0.344283***
			—	
			13	0.978901***
VAR 3	Jarque-Bera	White	Rao F-Stat	
	9.862019***	χ^2	lag	
		800.6894***	1	1.048342***
			2	1.519539**
			+—	
			13	0.798902***
VAR 4	Jarque-Bera	White	Rao F-Stat	
	10.10622***	χ^2	lag	
		1546.633***	1	0.775427***
			2	1.522621**
			—	
			13	0.937949***

Source: Own formulation. Asterisks indicate coefficients are significant at 95 (**) and 99 (***) percent.

Regarding the results of the first set of models, it is worth noting the presence of cointegration for VAR 1 and that the causal relationship was confirmed in the short and long term in both models.

Thus, both the Toda and Yamamoto test, as well as the Granger test, point to the existence of cointegration, which is consistent with what has been theoretically stated about the relation between the two prices.

Figure 2. Directionality of causality in VAR 1 and Var 2.



Source: Own formulation.

We identify that in the first case there is a bidirectional relation between the spot price and the future price at 90 and 95 percent of confidence, however at 99 percent of confidence we can only confirm the unidirectional relation from the future price to the spot price in Toda and Yamamoto's sense, while in Granger's sense for the second case, we can confirm this bidirectional relation at 90, 95 and 99 percent, so both price series have relevant information in the determination of the other, the future spot relation being the one with a higher percentage of confidence.

Table 3. Results of VEC 1 and VAR 2 causality analyses.

Toda and Tamamoto´s Causality Analysis in VEC 1	
	Squared-Chi
LPFM does not cause LPSNM	18.80890***
LPSNM does not cause LPFM	7.170212**
Granger's Causality Analysis in VAR 2	
	Squared-Chi
DLPFM does not cause DLPSNM	48.91729***
DLPSNM does not cause DLPFM	24.48205***

Source: Own formulation. Asterisks indicate coefficients are significant at 95 (**) and 99 (***) percent.

As far as the impulse response analyses are concerned, both models show a sustained relation between spot and future price, although from future to spot price, an immediate and faster initial shock is reported followed by a decline and convergence, while conversely the impulse seems to converge and be sustained over time. For the second set of models, the persistence of the bidirectional causal relation in the Granger sense between PSNM and PFM stands out; however, the incorporation of other variables allowed a better description of the interconnection between financial instruments defined to incorporate other markets.

Table 4. Results of VAR 3 and VAR 4 causality analyses.

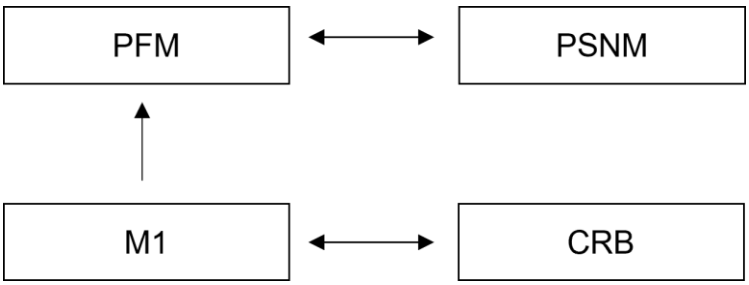
Granger's Causality Analysis in VAR 3	
	Squared-Chi
Set does not cause DLPSNM	74.41979***
Set does not cause DLPFM	57.90749***
Set does not cause DLCRB_sa	53.13840***
Set does not cause M1/IPC_sa	56.79852***
Granger's Causality Analysis in VAR 4	
	Squared-Chi
Set does not cause DLPSNM	82.71896***
Set does not cause DLPFM	57.17217**
Set does not cause DLCRB_sa	55.62294*

Set does not cause M1/IPC_sa	70.35535***
Set does not cause DJIA_sa	68.96681***

Source: Own formulation. Asterisks indicate coefficients are significant at 90(*), 95 (**) and 99 (***) percent.

Regarding the causality relations identified in VAR 3, the directionality relation is shown in Figure 2, where we can identify the relations between the two contagion systems identified from the model and how they are tied through the direction of causality from M1 to PSNM. This relation is manifested as a connection point through which the yields of the futures and spot prices of yellow corn are integrated, respond and adjust through the feedback allowed by the money supply, maintaining a bidirectional relation with the CRB index. As described above, it contains a broad basket of futures and is identified as the global benchmark for returns on futures in the commodity sector.

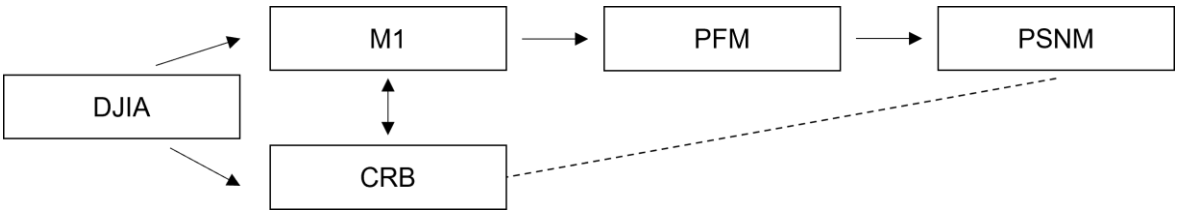
Figure 3. Directionality of causality in VAR 3.



Source: Own formulation.

On the other hand, we find the causal relations identified in VAR 4, which are consistent with what was proposed in the previous models, in addition to broadening the analysis by identifying not only the persistent relation between the systems identified but also integrating the interconnection between another of the most important and representative derivatives markets of the industry in the United States of America. Thus, Figure 3 shows the system integrated by M1 and the CRB index at the center of the causality relation, while pointing out that the DJIA contains valuable information in the determination of both M1 and CRB, which are subsequently tied through the future price to the spot price.

Figure 4. Directionality of causality in VAR 4.



Source: Own formulation.

Finally, in both impulse response tests, consistency can be observed with the same tests in VAR 1 and VAR 2 for the PSNM and PFM variables, namely, we identify that in response to innovations, there is a sustained reaction in the long term in which after the initial shocks, converges and is maintained over time for the spot-future relation. Conversely, an immediate and rapid initial shock is reported followed by a decline and subsequent convergence.

4. Conclusions and Policy Recommendations

In general terms, we conclude that there are contagion and price transfer effects among the variables analyzed, where different causal relations are identified among the variables used in the four models analyzed. The existence of a network of relations between the yields of the prices analyzed and the different financial instruments representative of the markets chosen for the estimations was then verified, which is in line with what has been theoretically proposed on the matter. Based on this confirmation, it was also possible to identify the existence of contagion and transfer systems interconnected through a monetary mechanism as described in the analysis of the results of the VAR and VEC tests.

This correlation between spot and stock market prices leads to an increase in the speculative activity described in the financialization process, a situation that poses challenges for the sector, especially in the decision-making process in terms of international trading.

Due to the importance of both the sector and the main product under analysis in the Mexican case, it is necessary to maintain constant monitoring of the relation between spot and futures prices, as well as a critical view of the prioritization of speculative activities over those that guarantee risk management. The adoption of regulatory measures and policies that suggest necessary plans to limit the speculative activity in the financial system together with measures for the development of the agricultural sector that would guarantee the stability of the agricultural trade balance, would support agricultural production and would guarantee the necessary recapitalization but under regulatory frameworks for the use of financial instruments on agricultural commodities, are proposals that are still valid in the context of the above-mentioned analysis.

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