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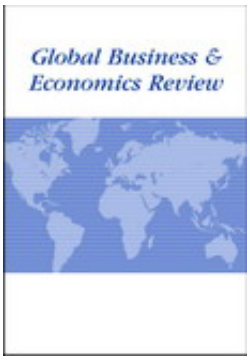

Global Business and Economics Review

ISSN online: 1745-1329 - ISSN print: 1097-4954
https://www.inderscience.com/gber

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DOI: 10.1504/GBER.2025.10059359

Article History:

Received:	19 March 2023
Last revised:	30 June 2023
Accepted:	21 July 2023
Published online:	03 December 2024

Price discovery of commodity markets: bibliometric analysis

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Abstract: This study aims to conduct a citation-based analysis of academic research on price discovery of commodity markets (PDCM). For this purpose, data is collected using a database such as Web of Science; 200 articles written by 446 authors and published in 114 different journals from 2000 to 2021 were examined using visualisation tools. The collected data are analysed using keyword co-occurrence and scholarly co-citation approaches are used to investigate research areas and development trends. Several studies have investigated the impact of news announcements, analyst forecasts, and other information sources on the efficiency of the commodity market. The results of these studies suggest that information plays a crucial role in price discovery and can significantly impact market outcomes. Another significant theme in the literature was the analysis of market structure and its impact on price discovery. Studies in this area have explored the effect of market concentration, trading volume, and liquidity on price discovery in the commodity market.

Keywords: price discovery; citation-based analysis; spot and futures; commodity markets.

Reference to this paper should be made as follows: Ravichandran, S. and Mamilla, R. (2025) 'Price discovery of commodity markets: bibliometric analysis', *Global Business and Economics Review*, Vol. 32, No. 1, pp.1–15.

Biographical notes: Supriya Ravichandran is a research scholar in the stream of finance and working on price discovery of commodity market. He presented more than four papers in reputed international conferences as well as published papers. He attended various workshops and FDPs organised by reputed institutes in India.

Rajesh Mamilla is working as a Professor and HOD-MBA with more than 17 years of experience in teaching in the stream of management-finance. He published more than 23 papers in various reputed journals indexed in ABDC, Scopus and UGC listed journals. He published 14 case studies in Case Centre UK. He has presented more than 18 papers in various government-funded seminars and conferences like IIMs, GLOGIFT, AICTE, UGC and DST. He published a textbook in collaboration with German publishers. Three scholars completed PhD in the domain of Finance, and four more in the process of completing their PhD.

1 Introduction

> "Unveiling the Secrets of Price Discovery in the Dynamic Commodity Market."

Imagine a bustling marketplace where buyers and sellers engage in a complex dance, constantly seeking the true value of commodities. This is the realm of price discovery, an enigmatic process that lies at the heart of the global commodity market (Zhang et al., 2022). It is a captivating world where prices emerge, evolve, and dictate the fate of industries, economies, and even nations (Baffes et al., 2022).

In this intriguing journey, we will delve into the intricate mechanisms that govern the price discovery process, uncovering the hidden forces that shape the ebb and flow of commodity markets (Garg et al., 2023). Prepare to be captivated by the interplay of supply and demand, influenced by a multitude of factors ranging from geopolitical events to climate patterns, technological advancements, to market sentiment (Rastogi and Kanoujiya, 2022).

The commodities market has historically been used as a gauge of economic health, reflecting both the pulse of countries and the aspirations of individuals. Commodities are the lifeblood of our interconnected world, from the gleaming appeal of gold to the essential energy sources of oil and gas, from the basic crops that sustain us to the raw minerals that power our businesses (Borodin et al., 2023; Sieczka and Hołyst, 2009). As a result, commodities play a crucial role in maintaining the health and prosperity of our globalised society. As we navigate this labyrinth, we will encounter the instruments and platforms that facilitate price discovery, from commodity exchanges to electronic trading systems. Uncover the intricacies of futures markets, where buyers and sellers engage in forward contracts, seeking to mitigate risk or profit from price differentials (Magalhães et al., 2022). Marvel at the world of options and derivatives, where financial alchemy unlocks new avenues for speculation and hedging.

In conclusion, price discovery is a critical component of commodity markets, and it is important for market players that it operates effectively. The studies described above show the relevance of the futures market in price discovery, as well as the impact of trading volumes and liquidity on the effectiveness of the price discovery process.

Bibliometric analysis can be used to assess the impact of research on price discovery in commodity markets. Price discovery refers to the process of determining the equilibrium price for a commodity through the interaction of supply and demand. The use of bibliometric analysis in price discovery research can provide insights into the influence of academic research on the price discovery process. One of the main reasons for doing bibliometric analysis in price discovery research is to identify the most influential research papers and authors in the field. This information can be used to assess the impact of academic research on the price discovery process and to identify potential gaps in the literature. By analysing citation patterns, can also provide insights into the diffusion of knowledge and the development of research networks.

Another reason for doing bibliometric analysis in price discovery research is to evaluate the effectiveness of different research methodologies. For example, by comparing the citation patterns of empirical and theoretical research papers, it may be possible to assess the relative contribution of different research approaches to the price discovery process.

Bibliometric analysis can also be used to identify the most relevant journals and research institutions in the field of price discovery. This information can be used to inform decisions about where to publish research, where to seek funding, and where to collaborate with other researchers.

Overall, bibliometric analysis can provide valuable insights into the impact of academic research on the price discovery process in commodity markets. By identifying the most influential research papers, authors, and institutions, bibliometric analysis can help to inform research priorities and facilitate collaboration amongst researchers working in this field.

Some potential research questions that a bibliometric analysis could explore in this area include:

- What are the most influential publications and authors in the field of commodity price discovery?
- How has research on commodity price discovery evolved over time, and what are the current trends?
- What are the most common research methods used in studies of commodity price discovery, and how do they compare in terms of their effectiveness?
- Are there any geographic or institutional biases in the literature on commodity price discovery?
- What are the key factors that affect price discovery in commodity markets, and how do they vary across different commodities and market contexts?

By answering these questions, a bibliometric analysis can provide a comprehensive overview of the research landscape on commodity price discovery and help to guide future research efforts in this important area.

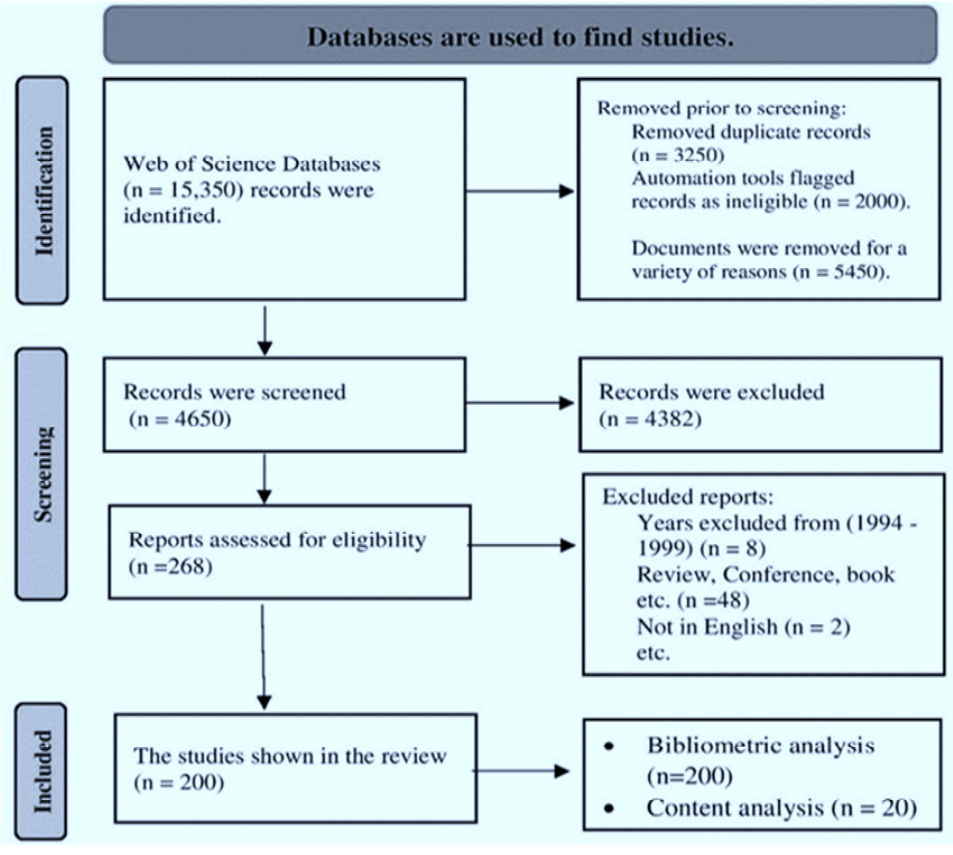
2 Methods

Academicians all over the world use the PRISMA format to publish findings and create research frameworks. SLR is a method for improving reviews' and meta-analyses' efficacy. The PRISMA 2020 flow chart is being used in the analysis to highlight the overall research process for selecting and rejecting research articles. PRISMA stands for preferred reporting items for systematic reviews and meta-analyses. This analysis uses a small amount of the available literature on price discovery in a commodity market.

2.1 Data and basis for selection

The Web of Science databases are used to retrieve articles containing the terms 'commodity market'. A total of 15,350 results were found in the database, and the internal search tool is being used to eliminate out results such as 'price discovery'. After that, the database's size reduces the number of results to 4,650. After duplicate documents and irrelevant titles are removed from the process, the database is searched for articles published in English. As a result, there are now 268 possible outcomes. The final set of findings is made up of 220 of the results, which are subsequently examined. The entire process of selecting the data is shown in Figure 1.

Figure 1 PRISMA 2020 flow diagram (see online version for colours)



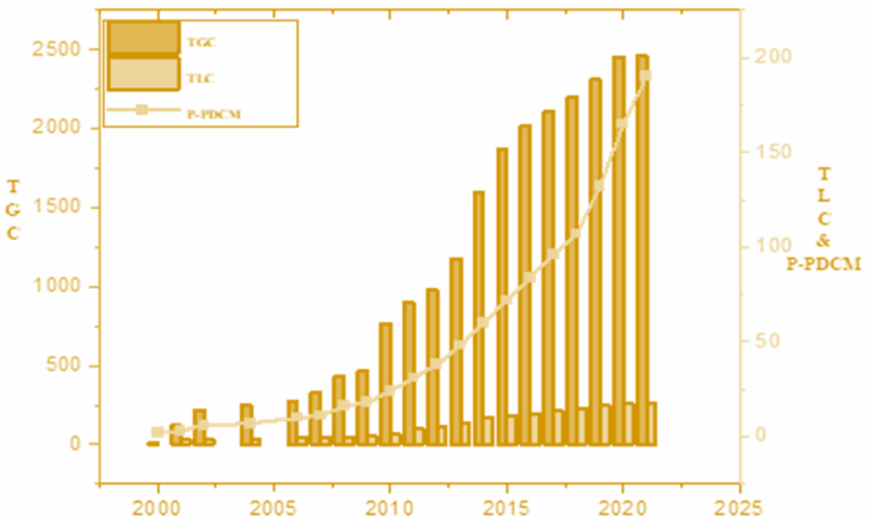
2.2 Bibliometric methodology

To aid in the process of revealing the citation relationships of the 200 identified works, bibliometric data was used in analytical visualisation software such as HistCite, Citespace 5.8 R3, and VOSviewer. HistCite is a data analysis tool for studying and visualising the links between direct and indirect citations in published works. For citation analysis, indicators like co-occurrence for all keyword analyses and bibliographical coupling for countries are used.

3 Results and discussion

A total of 200 publications published on price discovery of commodity market (PDCM) over 21 years (2000–2021) were discovered and subsequently retrieved from the Web of Science database, which was also included in the research (see overview in Figure 2).

Figure 2 PDCM articles published during 2000–2021 (see online version for colours)



Notes: P-PDCM: number of articles published related to price discovery of commodity market; TLC: total local citation received; TGC: total global citation received

The year 2000 is an excellent starting point for the study because it was at this time that the government aggressively encouraged price discovery in the commodity market. The sample of 200 publications was written by 446 writers from 305 universities.

This work has been cited a total of 2471 times worldwide. Total global citation (TGC) is based on the total number of times an article has been cited on the Web of Science. This factor explains the different aspects as well as their overall effect on academic performance research. Although TGC is important, it does not reflect the extent of the influence of authors, institutions or articles on the specific PDCM research stream.

Therefore, the total local citations (TLC) should also be reported. The frequency with which an article was referenced by a few other articles from the same research group (i.e. samples of 200 articles) is denoted by 'TLC'. In addition to 'TGC' and 'TLC', Total local citation value per year (TLC/t), total global citation value per year (TGC/t), and total local citation trend patterns ('TLCe') are available. Data-analytical visualisation and analysis approaches were developed based on the results of the citation analysis.

3.1 Most influential journals

A sample size of 200 papers from journals with five primary priority areas was published: economics (42%); business finance (30%); agriculture economics policy (13%); management (11%); business (9%); and environmental studies (5%). Amongst the 114 journals included in the analysis, four publications were discovered to have published 5 or more articles relating to PDCM.

Journal of Futures Markets (JFM) (26 papers), *Energy Economics* (EE) (13 articles), *Resources Policy* (RP) (10 articles), and *Journal of Commodity Markets* (JCM) (10 articles) (6 articles). From the perspective of published quality, TLC/t ('total local citations per year') JFM was revealed to have the most influence on the PDCM literature

record, with a TGC/t of 11.19. JFM came in second, followed by RP (1.86), EE (1.35), and JCM with a TLC/t of 1.33.

Table 1 TLC/t ranking of the top 20 records of influential journals

Rank	*Journal*	*AJG rank**	*TLC/t*	*TGC/t*	*PPDCM*
1	*Journal of Futures Markets*	3	11.19	44.67	*26*
2	*Energy Economics*	3	1.35	21.51	*13*
3	*Resources Policy*	2	0.4	36.09	*10*
4	*Journal of Commodity Markets*	3	1.33	8.83	*6*
5	*Agricultural Economics*	2	0.14	2.3	*4*
6	*American Journal of Agricultural Economics*	3	1.86	9.9	*4*
7	*Economic Modelling*	2	0.56	5.82	*4*
8	*Global Business Review*	1	1.17	3.56	*4*
9	*Journal of International Money and Finance*	3	0.92	5.33	*4*
10	*Agricultural Finance Review*	1	1.17	2.83	*3*
11	*China Agricultural Economic Review*	1	0.65	1.88	*3*
12	*International Review of Financial Analysis*	3	0.4	18.63	*3*
13	*Journal of Agribusiness in Developing and Emerging Economies*	-	0.95	3.52	*3*
14	*Agrekon*	1	0	0.53	*2*
15	*Applied Economics Letters*	1	1.5	3.75	*2*
16	*Energies*	-	0	1.08	*2*
17	*European Review of Agricultural Economics*	3	1.22	4.57	*2*
18	*Finance Research Letters*	2	0	4.5	*2*
19	*Food Policy*	3	0	2.08	*2*
20	*IIMB Management Review*	-	0	0	*2*

Therefore, as a result, only a few quality journals publish articles related to PDCM. Table 1 gives a summary of 20 prominent journals on the PDCM literature record. Table 2 shows the top five most influential universities in terms of the number of contributions: the University of Illinois (6 papers), China Agricultural University (5), the University of Delhi (5), the University of Georgia (5), and Griffith University (3). Dartmouth College (229), the National Bureau of Economic Research (NBER) (229), Princeton University (229), Beijing Institute of Technology (181), and Texas A&M University are the most renowned universities in terms of TGC (142). Educational institutes that have had the greatest influence on the PDCM in terms of literature, TLCs are nearly identical to TGCs scores, with the exception of Prairie View A&M University (28) having a slight advantage over Texas A&M University (28). By consolidating institutional contributions to PDCM at the global level, the USA has the highest number of contributions (57 publications), followed by India (38), China (34), Australia (23), Germany (18), and the UK (17) as depicted in Table 3.

Table 2 15 most influential institutions (filtered by P_{PDCM})

Rank	*Institution*	*PPDCM*	*% P_{PDCM} of total*	*TLCS*	*TGCS*
1	University of Illinois	6	3	12	62
2	China Agricultural University	5	2.5	10	28
3	University of Delhi	5	2.5	1	3
4	University of Georgia	5	2.5	1	32
5	Griffith University	3	1.5	7	36
6	MIT	3	1.5	1	4
7	Monash University	3	1.5	0	131
8	Pondicherry University	3	1.5	1	1
9	Tianjin University of Finance and Economics	3	1.5	1	3
10	University of California	3	1.5	7	63
11	University of Colorado	3	1.5	3	18
12	University of Liverpool	3	1.5	0	7
13	The University of Texas at San Antonio	3	1.5	4	94
14	Academia Sinica	2	1	2	24
15	Cochin University of Science and Technology	2	1	0	1

When the standard of contributions is high, the USA has the largest influence on this collection of literature, with a TGC of 1,060 and a TLC of 93. And with TGC: 441, TLC: 46, China is in the second position, UK (TGC: 334, TLC: 6), Australia (TGC: 319, TLC: 19), Germany (TGC: 250, TLC: 21), then India with 'TGC': 169, 'TLC': 62 shown in Figure 3 using network diagram.

Table 3 PDCM sorted by countries

Country	*Records*	*Percent*	*TLCS*	*TGCS*
USA	57	28.5	93	1,060
India	38	19	62	169
Peoples R China	34	17	46	441
Australia	23	11.5	19	319
Germany	18	9	21	250
UK	17	8.5	6	344

The results demonstrate the diversity of institutional settings that support efforts to advance the PDCM literature. While the attempt of Western institutions is undoubtedly greater than the contributions of developing countries.

3.2 Network methods

This study examines the words co-occurrence and co-citation network with VoSviewer software, creates a research mapping of commodities market price discovery, and studies research hotspot and explorations in this field.

3.3 Network analysis of co-occurrence keywords

The co-occurrence of keywords in the papers is the words highlighted by researchers that can be reflected topic of the work. Researchers are frequently affected by antecedents while indexing keywords. As a result, for indexing, they will employ the same or related keywords. Authors have approved the links that occurred between various key terms in a single article. When adequate writers admit these links and include comparable keywords in their articles, those interested in these connections can investigate hotspots and subjects spread over a single field.

Co-occurrence analysis of keywords identifies by examining a discipline's patterns and trends, assessing the strength of keyword associations. The co-occurrence of keyword a network can be created. Based on the co-occurrence pattern to examine the proximity between nodes in the network, reflecting content similarities. The evolution tendencies of research hotspots and themes are documented using a geographical map of the keywords network in this study.

The following cluster of keywords within Figure 5 demonstrates either that the subject has been continuously discussed in the investigated articles over time, with the keywords' being an average of articles published in the journal on mean between 2000 and 2021. The most co-occurred keywords are price discovery, volatility, commodity futures market, cointegration, financialisation, market, dynamics, commodity, speculations, and investments. The result highlighted the importance of price discovery.

3.4 Network analysis on co-citation

Citation links between literatures can represent the importance and growth of research areas. A co-citation connection exists between two articles if both were simultaneously cited by a third article. By using clustering methods, the different types of literature can be divided into documents. Clusters based on their importance, and citation association strength according to the network of citations found from this co-citation relation. This domain's cluster analysis atlas is created by determining the connectivity strength between different clusters based on network connectivity between document clusters. The network of citations is discussed within this section is analysed from two different viewpoints. Articles were published with a high citation count, examples of pivot points. Co-citation clusters are the other type. The volume of nodes stand for the frequency of co-citation, while the spheres represent heavily literature co-cited. As shown in Figure 4, the colour of the linkages corresponds to the year of the initial co-citation. There are 11 clusters that can be utilised to divide the network into two halves. The clusters above 'emerging derivatives market' are concerned with commodities market price discovery and its impact on the economy, whereas the cluster below 'emerging derivatives market' are concerned with trader performance and underlying knowledge and skill.

Figure 4 Co-occurrence networks (keywords) (see online version for colours)

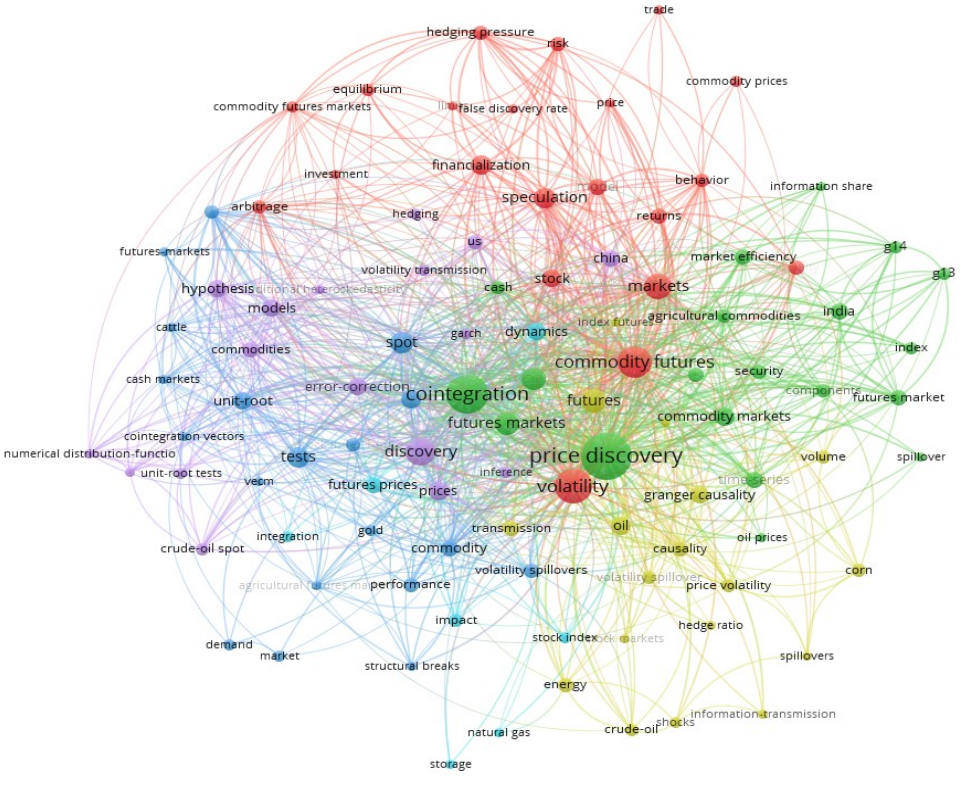
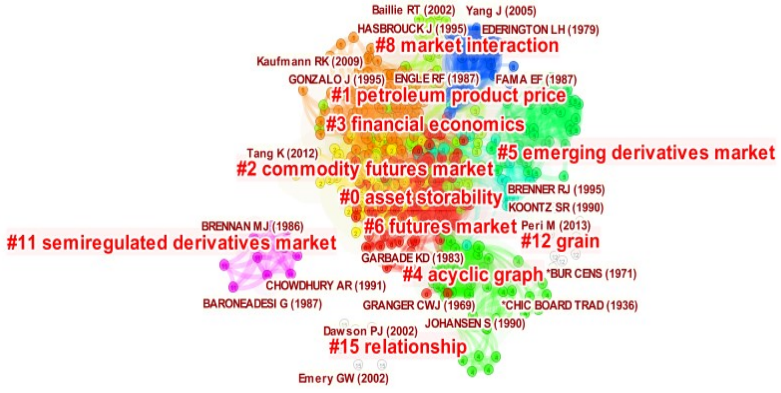


Table 4 Co-citation network with cluster label, mean year, and topics

Cluster-ID	*Cluster label*	*Mean year*	*Size*	*Topics*
0	Asset storability	1997	107	Future and forward pricing
1	Petroleum product price	2004	103	Price discovery; petroleum product price
2	Commodity futures market	2005	59	Commodity futures market; price discovery
3	Financial economics	1997	58	Financial economics; commodity transaction
4	Acyclic graph	1994	48	Full adjustment; spot price
5	Emerging derivatives market	1993	36	Emerging derivatives market; agricultural futures market
6	Futures market	2003	28	Cross-quantilogram analysis
8	Market interaction	1996	26	Market interaction; information transmission
11	Semi regulated derivatives market	1996	10	Migration of price discovery
12	Grain	1972	9	Grain prices
15	Relationship	1998	8	Structural breaks

Furthermore, cluster 5, 'emerging derivatives market', is discovered to be the link between technologies and economic impact on price discovery. The study topics for each cluster are shown in Table 4. Clusters 0 and 6 as well as Cluster 11, are about Future and forward pricing, cross-quantilogram analysis, migration of price discovery are factors that influence the market players to yield returns. Cluster 2 and 3 discuss commodity futures market; price discovery, financial economics; commodity transaction, and cluster 8 are mainly about market efficiency in disseminating the information for the price discovery process.

Figure 5 Co-citation network and clustering of commodity market (see online version for colours)



4 A review of the most active study areas in the PDCM literature

4.1 PCDM: global context on future and spot market prices

Literature is substantial on the discovery of prices. In order to examine a similar correlation between future and cash prices, an attempt has been made to explore the current literature on the subject, depending on the type of assets covered in the study. The recent considerable capital investment inflow into commodities futures exchanges has ignited a heated debate regarding whether financialisation has an impact on commodity pricing. Rather than discussing whether a price spike was caused by investment flows, they evaluate research studies from the view of how financial investors influence portfolio and data extraction in the commodities market. They contend that financialisation has had a considerable impact on commodity markets through these means (Cheng and Xiong, 2014). However, within the frameworks of multivariate generalised autoregressive conditional heteroskedasticity (MGARCH) and information sharing, This study investigates the transmission of information and price detection in informationally connected marketplaces, connected marketplaces. Liu and An (2011), in combination with trade data from China's futures/cash markets, the Chicago Board of Trade (CBOT), the New York Mercantile Exchange (NYMEX), and CME Globex copper and soybean futures markets, the research was conducted, there exists a Co-movement relation between price and price fluctuations spillover between the markets of the USA and China, with a stronger relationship from US to China markets than vice versa.

Furthermore, the NYMEX and CBOT play a larger role in transferring information from the US to the Chinese markets than the CME Globex. Moreover, they noted that the Chinese metal market is interacting faster than the NYMEX metals market to bridge the gap between the two markets. However, the opposite is true for soybeans. Finally, emphasise the existence of the NYMEX and CBOT futures market's primary drivers of price discovery.

According to the research examined in this article in the long-term pricing futures market performance for stored and non-stored commodities using stochastic interest rates as the composite factor, the storability of assets The presence of co-integration the difference between futures and spot contracts is unaffected or utility of futures market when forecasting future and cash prices (Yang et al., 2001). Kuiper et al. (2002) analysis of the link between cash and future for commodities markets at the Amsterdam Stock Exchange and the CBOT finds that the forward price fully adapts to its new level of equilibrium when the futures markets' pricing function is working properly. Similarly, Peri et al. (2013) examined the long-run relationship between corn and soybean spot and futures prices. And thereafter investigated within each, the relations between cash and future prices detected sub-period to examine price movements using the cointegration approach, which possibly allows for the occurrence of undetected structural breaks. Hernandez et al. (2014) examine volatility patterns between major exchanges in the USA, Europe, and Asia for global wheat, corn, and soybean. GARCH technique to adjust for potential bias when comparing transactions with varying closing times. The findings show that agri markets are extremely interconnected, with spillovers and dependencies on both their own and the other side of volatility between most exchanges. CBOT plays a significant in terms of spillovers to different markets. In the same way, speculation plays an important role in price detection. Dimpfl et al. (2017) examine the relation between market prices for corn, wheat, soy beans and oil, livestock, and thin hogs to determine which marketplaces are driving commodity pricing. The price levels of commodities are almost entirely unique to the spot price. The derivatives market accounts for less than 10% of price discovery over the long term; futures speculation negatively impacts commodity prices. Furthermore, the question of how often activity in trade is responsible for effective discovery price movement in cash and futures markets remains unresolved. Adammer et al. (2016) examine the price action of two lightly traded agri futures contracts traded on the Frankfurt Stock Exchange.

According to the empirical findings, the trade volume cut-off point required for effective pricing is relatively low. The findings, that are derived on continuous and time-varying vector error correction models, further reveal that ignoring parameter changes over time can result in misleading results.

Furthermore, Dolatabadi et al. (2015) the recently developed fractional cointegrated vector autoregressive model (FCVAR) was used to discover price movements in the spot and futures markets for five non-ferrous metals (copper, lead, aluminium, nickel, and zinc). On the spot market, there is little more evidence of price discovery. Moreover, they do not reject the hypothesis that price discovery occurs exclusively on the spot market (futures) for copper, lead, and zinc using standard likelihood ratio tests (aluminium and nickel). Han et al. (2013) examine the significance of the Dalian Commodity Exchange (DCE) in global soybean futures price discovery. Structural vector autoregression and vector error correction models were used to account for DCE and CBOT soybean futures returns during trading and non-trading hours, and the results suggest that information between the CBOT and the DCE affects CBOT price discovery in both directions.

Additionally, as the world wheat market locates, there is increased trading activity in international derivatives markets and shifting global trade proportions are taken as evidence of this transition, but neither implies that US futures trading are less important in wheat pricing. Although the US futures markets continue to dominate, the Paris markets' share of price discovery increased significantly in 2010, correlating with main supply shocks in Ukraine and Russia, study by Janzen and Adjemian, (2017). The impact of agriculture futures trading on price determination during intervals of price fluctuations and increased trading occurrence, Adammer and Bohl (2018) using a hand-collected dataset of canola, wheat, and corn spot and futures prices, price movement in cash and futures markets significant during initial period of price escalation (2007–2009), but less so through the second. These findings are noteworthy because increased futures market trading did not have a significant impact on spot markets.

Fan and Zhang, (2020) study the Commodity futures risk percentages' behaviour. Although China's term structure and momentum rewards remain stable, time-varying margins and tight position limits distort the skewness, volatility, and liquidity premiums. Additionally, inflation, currency, and open interest premiums are all affected by policy structures. The identified premiums are caused by liquidity, anchoring, and regulatory arbitrage limits rather than general risk, sentiment, transaction costs, or data snooping. Illustrate the distinguishing features of China's futures markets and evaluate the challenges that commodity risk percentages theories face. How should future exchanges be structured trading hours in the presence of a dominant exchange?

Similarly, Jiang et al. (2020) consider adding a night session to the Shanghai Futures Exchanges, permitting trade to take place alongside day transactions on the Exchange in the USA. Following the formulation of hypotheses, the results for precious metals show that: the level of trading activity in Shanghai has increased, as has the level of liquidity, and price increases are less volatile when the market opens. The market pricing component of the price of Chinese gold futures has dropped, but it is not indicative of a deteriorating market, and abnormal returns have increased in both directions. Extended trading hours have lowered the market segment while increasing the information flow.

4.2 PDCM: Indian context on future and spot market prices

In Iyer and Pillai (2010), the primary aim is of the study is to determine whether futures markets have an important influence on price detection. The pace of information convergence from cross-market is examined to determine the effectiveness of futures as a hedging strategy. Regarding six commodities (chickpeas, nickel, rubber, copper, gold, and silver). They found evidence of a price mechanism that occurs in five out of six commodities in future. Similarly, Ali and Gupta (2011) study the agro commodities markets' efficiency in India by examining the correlations between the futures contracts and the prices of the spot market for 12 commodities: corn, chickpea, black lentil, red lentil, guar seed, cashew, pepper, castor seed, soybean, sugar wheat, and rice. With the exception of wheat and rice, the results show that there is a strong co-integration price in the forward and future for all agricultural commodities examined. This suggests that most soft commodities such as corn, pepper, castor seed, chickpeas, black lentils, soybeans, and sugar have futures, and spot prices have a long-run relationship. Moreover, connecting futures trading and effectiveness prices in the commodity futures markets in India for 5 selected top commodities: gold, copper, crude oil, soybean oil, and chana (chickpea). The results show that all five commodities are efficient in commodities

futures markets. Additionally, there is insufficient evidence indicating that the derivatives market causes higher inflation said by Sahoo and Kumar (2009). On the same line, Joseph et al. (2014) study observes the route strength and degree of a significant relation between Indian commodity markets and price movements. The analysis of frequency-domain results shows there is a substantial unidirectional connection between futures and cash prices for almost all commodities studied. This implies that the futures market has a strong price-setting function in all commodities selected, indicating the efficiency of the Indian commodity derivatives.

In addition, Mahalik et al. (2014) investigated the Indian spot futures commodity markets, price, and market volatility is important factors. The research was based on 4 cash and future indices from Mumbai's Multi-Commodity Exchange. LAGRI (Agricultural Price Index), LENERGY (Energy Price Index), LMETAL (Metal Price Index), and LCOMDEX (Commodity Futures Price Index) (Overall Commodity Index). The results are cumulative in origins. Further research at a disaggregated level will provide additional insights into the price movements of specific commodities as well as into the pricing process. According to recent agricultural commodities studies, the derivatives market is efficient and continues to perform its pricing function admirably. Inani (2018) investigates the price detection and relative competence of the ten most liquid soft commodities in India (cilantro, cottonseed oilcake, castor seed, turmeric, soybean oil, sugar, guar gum, jeera, mustard seed, and chickpea) in contracts for future delivery on the country's largest soft commodity exchange (NCDEX). The conclusion is that the futures market is more effective in determining agricultural commodity prices.

5 Conclusions

Price discovery is a crucial process in the commodity market that refers to the determination of market prices through the interaction of buyers and sellers. As a result, understanding the factors that influence price discovery is essential for market participants, policymakers, and researchers. This bibliometric analysis examines the existing literature on price discovery in the commodity market, using data selected from the Web of Science database. The study aims to provide an interpretation of the research trends, themes, and gaps in the literature.

The analysis found that the number of publications on price discovery in the commodity market has been steadily increasing over the past decade. The *Journal of Futures Markets* (JFM), which published the most papers and had the highest TGC/t value, appears to have the biggest impact on the PDCM literature record, according to these data. It's crucial to remember that this judgement was made with the facts available and may change with additional research and contextual considerations. The majority of the studies were conducted in the field of finance and economics, with a smaller number in agricultural and environmental sciences. The analysis further revealed that the USA was the leading contributor to the literature, followed by India, China and Europe.

One of the primary themes in the literature was the examination of the role of information in price discovery. Several studies have investigated the impact of news announcements, analyst forecasts, and other information sources on the efficiency of the commodity market. The results of these studies suggest that information plays a crucial role in price discovery and can significantly impact market outcomes. Another significant theme in the literature was the analysis of market structure and its impact on price

discovery. Studies in this area have explored the effect of market concentration, trading volume, and liquidity on price discovery in the commodity market. The results indicate that market structure can have a significant impact on price discovery, and factors such as trading volume and liquidity can enhance the efficiency of the market.

Furthermore, the analysis revealed that the majority of the studies focused on the price discovery process in individual commodity markets, such as oil, gold, and agricultural products. However, there is a lack of research that examines the interconnectedness of these markets and the impact of cross-market price discovery on the efficiency of the commodity market as a whole. This gap in the literature suggests the need for further research in this area.

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