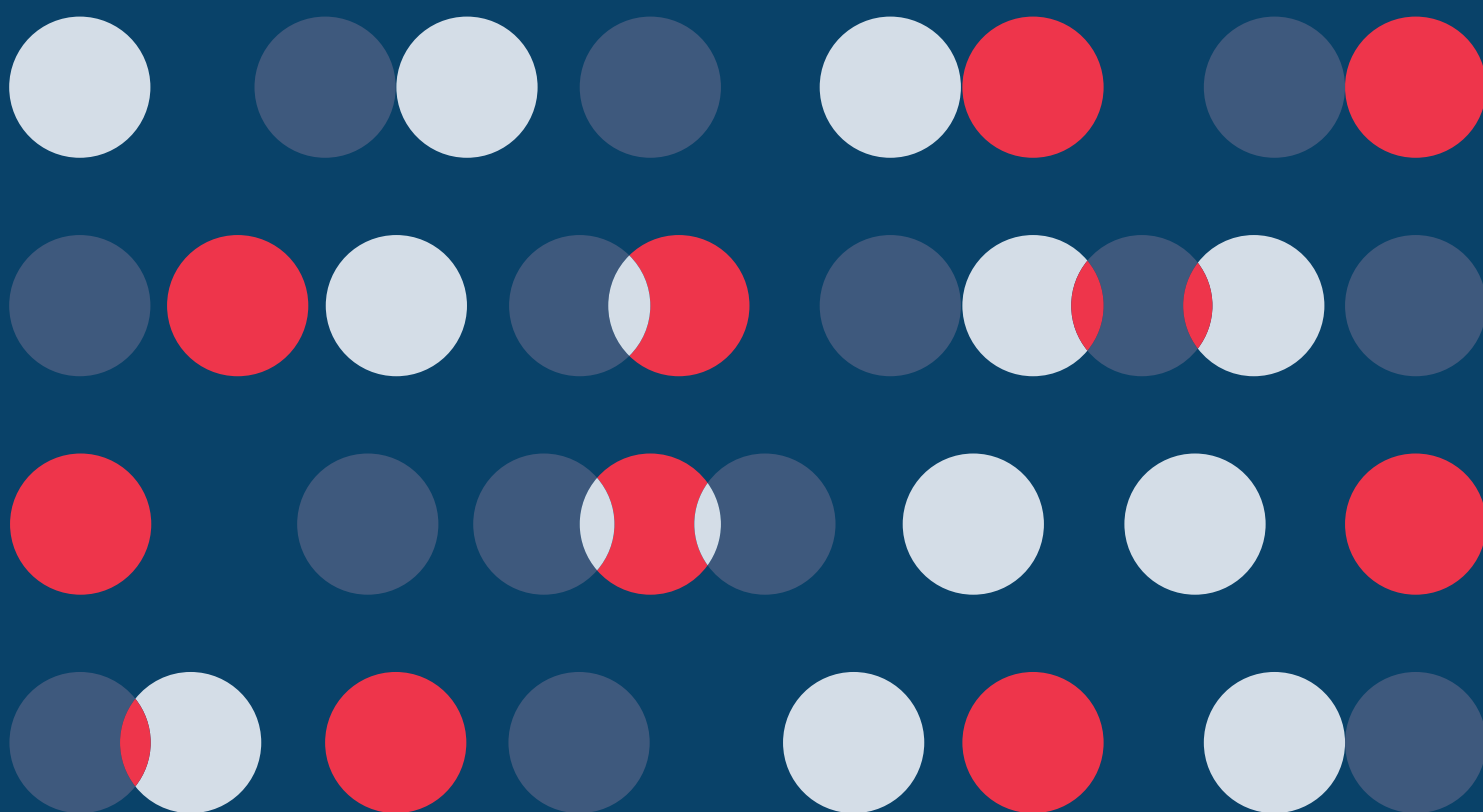


April 2020

GLOBAL EXPERIENCE OF COMMODITY FUTURES
SERVING THE REAL ECONOMY



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SUMMARY

A commodity futures contract is a standardised agreement traded on the exchange to buy or sell a predetermined amount of a commodity at a specific price on a specific date in the future. The global commodity futures market has demonstrated a close linkage with the spot market. In the US and the UK, major producers and consumers gathered for spot transactions and the futures market was then established to address the uncertainties on prices and timing of physical delivery. The prices of commodity futures, therefore, have become benchmark prices for spot transactions of commodities. Theoretically, commodity futures prices can be affected by spot market elements, including spot prices, interest rate, storage costs, contract tenor and potential benefits to use inventories for production. Empirical evidence showed that the global commodity futures market has a close linkage with the spot market and that linkage reflects economic fundamentals and market structure.

The commodity futures market serves different needs of hedgers and financial investors. Hedgers are key players in global commodity futures markets. They include commodity producers, consumers and trading firms who use commodity futures to hedge against adverse movements of commodity spot prices. The physical settlement of commodity futures through the global network of warehouses is key to the strong linkage between the spot and futures market as it provides a cost-effective way to obtain commodities for commercial uses. Financial investors treat commodity futures as an asset class for passive investment or active returns. Empirical evidences show that commodity futures could diversify investment portfolios by potentially giving higher returns and lower volatilities.

Mainland China's commodity futures market serves the real economy not as effectively as its developed counterparts in the world. The spot commodity market in Mainland China is fragmented such that the transaction prices usually vary across regions without reference to the corresponding commodity futures prices. The price volatility in the Mainland commodity futures market may be high due to speculative trading activities, which would affect the effectiveness of hedging. Besides, the limited choices of warehouses for physical delivery of commodities may increase the costs of storage, transportation and import taxes and the narrow range of product and currency denomination may not meet the various business needs in the Mainland. These affect the effective linkage between the Mainland commodity spot and futures markets. China is the second largest economy and one of the largest producers and consumers of a number of key global commodities. However, the Mainland commodity futures market has limited global interaction such that onshore and offshore hedgers cannot sufficiently reflect their price views on the global and Mainland commodity futures markets respectively. This contributes to the price difference between the two markets.

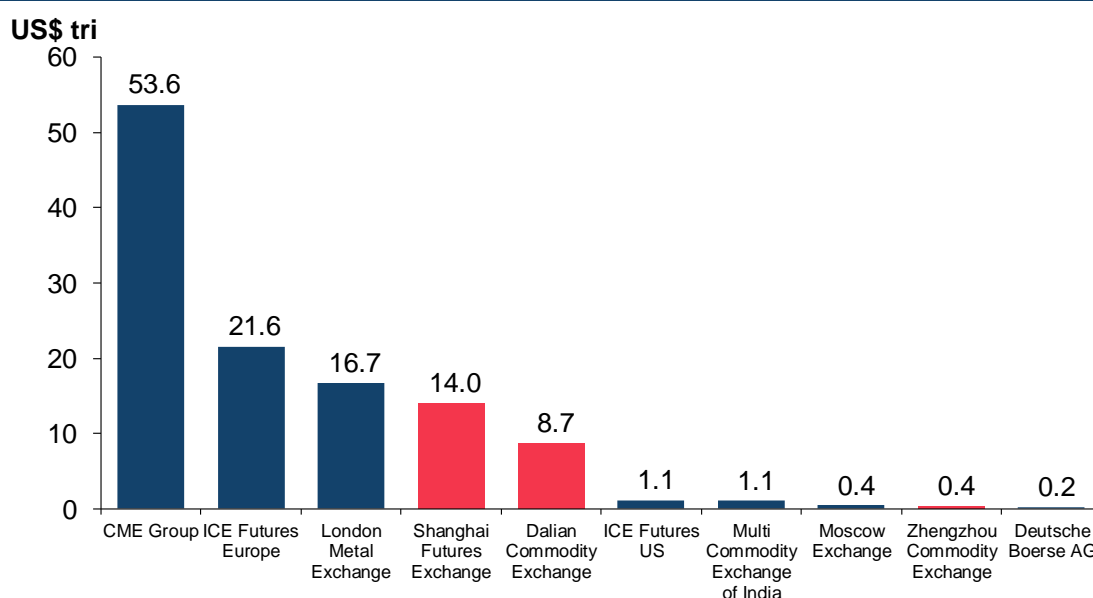
For the Mainland commodity futures market to better serve the real economy, the linkage between the Mainland spot and futures markets should be strengthened, and the Mainland futures market should have a greater pricing influence in the global market. To achieve this end, a number of initiatives could be considered. The use of commodity futures prices as benchmark prices in the spot market could be facilitated by consolidating trading and enhancing trade transparency in the Mainland spot market. The deviation of futures prices from the underlying fundamentals due to excessive speculation and transportation costs could be reduced by enhancing market regulation and expanding the warehouse network. The business needs of various sectors could be met by widening the product range and currency denomination. Moreover, the Hong Kong market, being an international financial centre at the front-door of China, could take the role as a super-connector in the commodities sector to further increase the global interaction of the Mainland commodity futures market, thereby helping strengthen the Mainland commodity futures market to better serve the real economy.

1. COMMODITY FUTURES IN CONNECTION WITH THE REAL ECONOMY

A commodity futures contract is a standardised agreement traded on the exchange to buy or sell a predetermined amount of a commodity at a specific price on a specific date in the future. The underlying commodity can be base metals, precious metals, agricultural products, energy products, chemicals and others. The futures contracts can either be physically settled (delivery of the physical underlying assets from the seller to the buyer) or cash settled (delivery of the settlement value in cash between the buyer and the seller).

The traders of commodity futures include producers, consumers, trading firms and financial investors, which overlap those in the commodity spot market in the real economy. Therefore, the price of commodity futures usually serve as the benchmark price of the underlying commodity. The trading of commodity futures in value terms has been dominated by exchanges in the United States (US) and Europe (see Figure 1). These partly reflect their key roles in the global commodity markets, particularly in terms of pricing power. Nevertheless, the Mainland commodity futures exchanges were also among the top ones ranked by nominal trading value in 2019.

Figure 1. Top 10 exchanges by nominal trading value of commodity futures (2019)



Note: The data of ICE Futures Europe and ICE Futures US were up to October 2019 and August 2019 respectively.

Source: Statistics published on the website of World Federation of Exchanges (WFE).

The global and Mainland commodity futures exchanges have different development paths, given the differences in the structure of the respective commodity markets. The experience in the global market has demonstrated a close linkage between commodity spot and futures markets, which is important for the price discovery of commodities. This shed light on the next steps of development for China's commodity futures exchanges.

1.1 Brief history of the global commodity futures market

The history of commodities futures in global markets has demonstrated its function to serve the real economy. In the US and the United Kingdom (UK), the spot markets of commodities have been developed for a long time and already gathered a critical mass of commodity users before the emergence of commodity futures exchanges. Commodity futures exchanges in these markets were established to centralise market trading in order to meet the demand for better price discovery and risk management.

In the US¹, Chicago became a regional hub of agricultural commerce in the early 19th century after the completion of canal and railroad infrastructure centered around the city. It facilitated spot commodity transactions at a centralised place to address chaotic price fluctuations and unpredictable supply and other challenges faced by US agricultural producers and consumers. The Chicago Board of Trade (CBOT), which was the world's first futures exchange, was formed in 1848 for spot transactions of grains between agricultural producers and consumers initially. Then the CBOT offered the earliest "forward" contracts² in 1851. In 1865, the CBOT launched the world's first commodity futures for grain trading, which were standardised agreements with physical delivery, clearing operations and "margin" (or "performance bonds") to be posted by buyers and sellers of grains. Subsequently, the New York Mercantile Exchange (NYMEX) and the Chicago Mercantile Exchange (CME) were formed in 1872 and 1919 respectively for initially spot trading of other agricultural products and launched commodity futures subsequently. Since late 1960s, these commodity exchanges expanded their product coverage to non-agricultural products, including metals, currencies, crude oil, interest rates and financial indices, etc. The NYMEX merged with Commodity Exchange (COMEX) in 1994 and were acquired by the CME Group in 2008, which was formed by the merger of the CME and the CBOT in 2007. The CME has then become a leading pricing centre of agricultural products and crude oil.

The UK³ has a long history of copper and tin trading for production of bronze and alloys. At first, metal trading was only for the domestic market. Since the UK had become a major exporter of metals more than a hundred years ago, London then became a centre for European traders of physical metals. The London Metal Exchange (LME) was established in 1877 to facilitate business activities on metals for commodity traders, ship charterers and financiers, with metal trading through the Ring (the early form of open-outcry trading). Back in early 19th century, the UK had been self-sufficient in copper and tin with quoted prices that remained fixed for long periods. Upon the Industrial Revolution, metal traders expanded trading and faced uncertainty on the arrival date for their imports of metal ores and concentrates from as far as Chile and Malaya. Technological advancement upon the invention of the telegraph led to more predictable arrival dates and facilitated the physical transactions with delivery on a fixed date. Further, the opening of the Suez Canal reduced the delivery time of tin and copper to London to three months. These led to the establishment of the LME's unique system of daily prompt dates for up to three months forward, which still exists to this day. Physical trading then expanded to a wider range of metals, including copper, tin, lead, zinc, aluminium and nickel as well as ferrous metals, precious metals and other metals. Now, the LME has become a leading price centre of metals and accounted for more than 70% of all metals traded on global exchanges in 2016⁴.

As seen from the development paths of commodity markets in the US and Europe, the demand for commodities has mainly come from commodity users, including producers, consumers, physical logistics and trading firms, which support the upstream sectors (the suppliers of raw materials in the production chain) and downstream sectors (the customers of raw material and the producers of finished goods) as well as business activities in the real economy. As the commodity spot market grew, an increasing range of commodities were traded and the commodity users faced uncertainties in prices and physical delivery. These

¹ Source: "Midwest Grain Trade: History of Futures Exchanges", published on the website of the CME Group, viewed on 8 November 2019; "美國六大期貨交易所——CBOT、CME、NYMEX……", published on *kknews.cc*, 8 August 2017.

² Forward contracts are different from futures contracts in that the contract specifications (e.g. contract size and settlement date) are not standardised and the contracts are often traded over-the-counter but not on-exchange.

³ Source: "History", published on the website of the London Metal Exchange, viewed on 8 November 2019; "Basic knowledge of futures 6: The development process of futures market" (〈期貨基礎知識六：期貨市場的發展過程〉), published on *xueqiu.com*, viewed on 7 November 2019.

⁴ Source: "LME pauses fund charm offensive to calm traditional members", *Reuters*, 1 November 2016.

resulted in the demand for a commodity futures market to serve the different needs of commodity users.

1.2 Why the commodity futures market is needed for price discovery?

The spot market has played a key role in the real economy and dominated trading in the commodities market. As an illustration, the traditional spot market (price negotiated at the time of goods sale just before delivery) accounted for about 60% of agricultural commodities in the US in early 2001⁵. For transactions in the commodity spot market, the price can be set through the following pricing mechanisms⁶:

- **Bilateral contract:** It is the predominant form of transaction mechanism in the spot market. A bilateral contract is customised between a buyer and a seller that specifies the commodity specification, price, quantity, time and location of physical delivery.
- **Transfer price:** It is the price set for internal transactions between two entities (e.g. an upstream subsidiary and a downstream subsidiary) of a vertically integrated corporation. The transparency is low as the trade can only be found in financial statements of these firms. In the case of cross-border transfer transactions, the import prices tend to be underpriced to reduce the burden of tariff.
- **Posted price:** It is the price instituted by the government to avoid tariff evasion. It can be set with reference to the production cost or the prevailing transaction prices between independent parties.
- **Producer-dictated price:** It is the price set by a few number of the largest producers given their high concentration of market power.
- **Consumer-driven price:** It is the price set by a few number of the largest consumers given their high concentration of market power.
- **Private auction:** The price is set either through ordinary auction (priced at the highest bid price of buyers) or Dutch auction (priced at the lowest offer price of sellers). Private auction accommodates many buyers and sellers in the market and the commodity specification is not standardised. Private auctions are not continuously conducted.

The prices in the spot market are highly decentralised and vary significantly across the types of pricing mechanisms mentioned above. The user's choice among these mechanisms depends on tariffs, government policy, commodity specification, timing of transaction and the relative market power of producers and consumers. While certain commodity users can take advantage of the customised contracts at favourable prices, these transaction prices may not be good reference prices for all market transactions. Take bilateral contract as an example. The contract price of major producers can be a reference price for certain commodities. However, the price information is private and may not be transparent to the market. Another concern is the reliability of such reference price. For metals and energy products, a study⁷ reported that the share of total world production of the top four or five leading producers declined significantly for aluminium, nickel and crude oil during 1955 to 1990. The transaction prices of these producers therefore became less representative. Besides, as the terms on bilateral contracts are customised, the commodity specification or contract tenor may not be comparable across contracts. As a result, the actual prices of transactions in the spot market

⁵ Source: MacDonald, J. M. et. al. (2004) "Contracts, markets, and prices: Organising the production and use of agricultural commodities", *Agricultural Economic Report* No. 837, published on the website of the US Department of Agriculture (USDA).

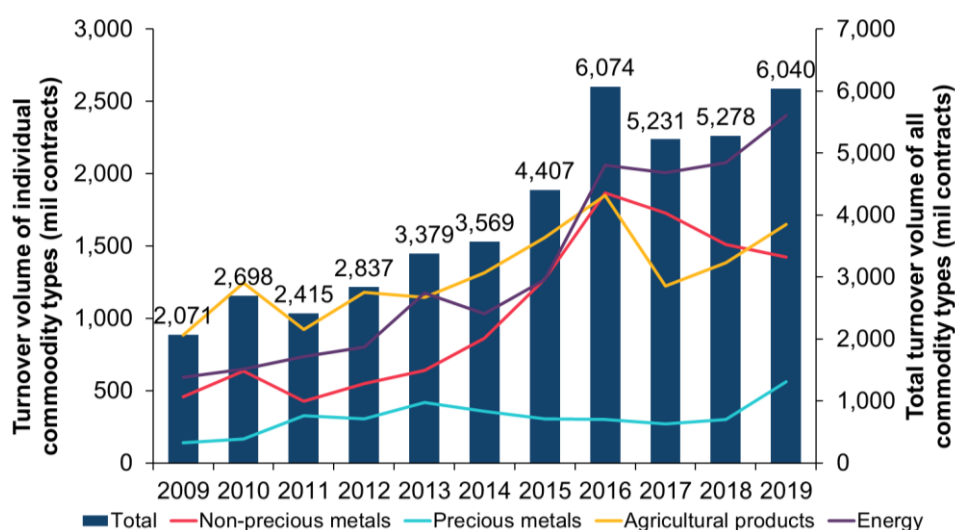
⁶ See Radetzki, M. (2013) "The relentless progress of commodity exchanges in the establishment of primary commodity prices", *Resources Policy*, Vol. 38, pp.266-277.

⁷ Ditto.

can deviate to different extents from the prevailing reference price and less systematic for certain commodities.

In the light of this, the commodity futures market is complementary to the spot market for price discovery. Commodity futures are highly standardised in respect of commodity specification, contract size and settlement date. Commodity futures exchanges allow continuous price auctions between buyers and sellers without entry barriers. Besides, the pricing information in the futures market is much more transparent than those in the spot market, and this facilitates the price discovery of commodity prices. Furthermore, commodity futures exchanges act as the central counterparty to mitigate the counterparty risk and facilitate the clearing and settlement of commodity transactions. The demand for commodity futures has been evidenced by the growing transaction volume of commodity futures for metals, agricultural and energy products in the global commodity market (see Figure 2). Active trading increases the reliability of futures prices as the reference prices of the underlying commodities.

Figure 2. Annual turnover of commodity futures in global markets by type of commodity (2009 – 2019)



Note: The contract size of commodity futures varies across exchanges. The same turnover volume of different futures products may not represent the same nominal trading value.

Source: Futures Industry Association (FIA).

1.3 Empirical evidences on commodity futures as a key for price discovery in the spot market

Commodity futures in global markets are usually physically settled and this involves commodity storage costs (e.g. warehousing, insurance). Besides, commodity users have the choice between consumption today and holding the physical inventory of a commodity as a consumption good rather than as a financial asset. The pricing of commodity futures is therefore different from that of financial futures, which only take into account the interest rate for the expected value.

To price commodity futures, we can consider that a commodity user has two ways to obtain the commodity in a future time. First, the user can borrow money at interest rate “ r ” to buy the commodity now at spot price “ S ” and hold the commodity with storage costs “ k ” and enjoy the benefit of holding the physical commodity as inventory with a convenience yield⁸ “ ψ ” for “ T ” years. The second way is to long a commodity futures contract that commits to buy the commodity at a strike price “ F ” after T years and then invest the present value of F into a risk-

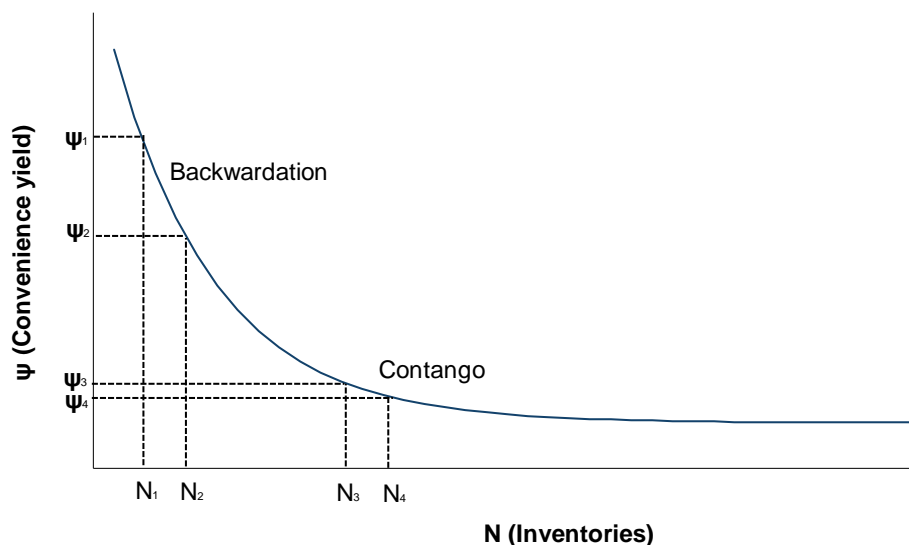
⁸ Convenience yields apply to storable commodities that the demand can be met out of current production or inventory. The potential benefits include the ability to profit from temporary shortages and the ability to keep a production process running.

free asset to ensure the sum for future purchase. The two ways should have the same cash flows and costs in an efficient market. Otherwise, an investor can go for the cheaper way to get the commodity and sell it at a higher price through the other way to make arbitrage profits without any risks. As a result, the logical relationships are that the commodity futures price (F) is positively associated with the spot price (S), the interest rate (r), the storage cost (k) and tenor of contract (T), but negatively associated with convenience yield (ψ)⁹.

Besides, the level of inventories can affect the futures price in different scenarios of demand and supply of commodity in the real economy. A study¹⁰ looked into the spot price, futures price and inventory data of base metals traded on the LME during July 1997 to June 2009. The study discussed the price and inventory adjustments in backwardation¹¹ and contango¹² situations. The study found that:

- In a backwardated futures market, the level of inventories is likely to be too low to meet the demand in the real economy, such that the inventories become more valuable to commodity users (e.g. to keep production process running) and the convenience yield will be higher (see Figure 3). This could push up the spot price and drag the futures price below the spot price¹³.
- In a contangoed market, the level of inventories is likely to be abundant to meet the demand in the real economy, the convenience yield will be diminished and lead to a lower spot price than the futures price.

Figure 3. Illustrative diagram on the relationship between convenience yield and inventories



Source: Roache, S. and N. Erbil. (2010) "How commodities price curves and inventories react to a short-run scarcity shock", *IMF Working Paper*, WP/10/222.

A number of studies gave empirical findings on the relationship between the commodity futures market and the real economy:

⁹ See Pindyck, R. (2001) "The dynamics of commodity spot and futures markets: A primer", *Energy Journal*, Vol. 22, pp.1-29.

¹⁰ Roache, S. and N. Erbil. (2010) "How commodities price curves and inventories react to a short-run scarcity shock", *International Monetary Fund (IMF) Working Paper*, WP/10/222.

¹¹ Backwardation is the situation where the futures price of an underlying asset is lower than the spot price.

¹² Contango is the situation where the futures price of an underlying asset is higher than the spot price.

¹³ This is the case of "strongly backwardated" market. If the spot price is only higher than the discounted value of the futures price, then the market is "weakly backwardated".

- Empirical evidence showed that the prices and open interests of commodity futures have a close linkage with the real economy. A study¹⁴ examined the characteristics of price performance of commodity futures by constructing an equal-weighted commodity futures index covering all commodity futures using the data of the Commodity Research Bureau (CRB) in the US and of the LME during July 1959 to March 2004. It found that the price return of commodity futures was positively correlated with inflation, unexpected inflation and changes in expected inflation. Another study¹⁵ found that the open interests of commodity futures in the US during December 1964 to December 2008 were highly procyclical and positively correlated with macroeconomic activities. The study findings showed the predictive power of open interests of commodity futures in commodity returns, bond returns and short-term interest rates. This may be attributable to the hedging activities of commodity producers and consumers in the futures market (see Section 2.1).
- The linkages among commodity futures prices revealed the linkages in different sectors of the real economy. Commodity futures are heterogeneous that the pricing in different markets of commodity futures have different levels of efficiency¹⁶. This is in line with the fact that the prices of goods in upstream industries usually respond more quickly than the prices of goods in downstream industries. The prices of finished goods in downstream industries will adjust with a time lag if the price change of raw material is persistent. An example¹⁷ is demonstrated in the economic linkages of commodity futures of palladium, natural rubber and gasoline in the automobile industry in Japan (which accounted for more than 50% of world consumption) that the shocks of volatility (or volume) in palladium futures affected the volume (or volatility) of natural rubber and gasoline futures.
- Commodity futures prices serve as reference prices for the logistics sector. A research¹⁸ studied the daily price data of the forward agreements on dry bulk freights at Baltic Exchange as well as the futures available in the US and Europe and the over-the-counter (OTC) derivatives on commodities transported in the freight during May 2006 to October 2009. The paper found that the shocks on price return and volatility appeared in the commodity futures first and then spilled over to the freight derivatives.
- The economic fundamentals and structural differences of major commodity markets contribute to the price discovery of commodity futures. An example is soybean. The exports of soybeans from the US and Brazil are the largest in the world (about 83% of total exports during 2016-2017¹⁹). The direct trading access (or order routing) of futures by qualified investors between the CME and Brazil's BM&F Bovespa (referred to as "BM&F") began in September 2008 for the access to the CME and in February 2009 for the access to BM&F. A study²⁰ found that the qualified investors contributed to the transmission of information flows and helped the price discovery of soybean futures in the two markets during the partly overlapped trading hours.
- The structural differences between commodity futures markets in respect of their connection with the physical market contributed to futures price differentials. In the case

¹⁴ Gorton, G. and K.G. Rouwenhorst. (2006) "Facts and fantasies about commodity futures", *Financial Analysts Journal*, Vol. 62, pp.47-68.

¹⁵ Hong, H. and M. Yogo. (2012) "What does futures market interest tell us about the macroeconomy and asset prices?", *Journal of Financial Economics*, Vol. 105, pp.473-490.

¹⁶ See Kristoufek, I. and M. Vosvrda. (2014) "Commodity futures and market efficiency", *Energy Economics*, Vol. 42, pp.50-57.

¹⁷ See Chng, M.T. (2009) "Economic linkages across commodity futures: Hedging and trading implications", *Journal of Banking and Finance*, Vol. 33, pp.958-970.

¹⁸ Kavussanos, M. G. , I. D. Visvikis and D. N. Dimitrakopoulos. (2014) "Economic spillovers between related derivatives markets: The case of commodity and freight markets", *Transportation Research Part E*, Vol. 68, pp.79-102.

¹⁹ Source: Gale, F., C. Valdes and M. Ash, "Interdependence of China, United States, and Brazil in soybean trade", published on the USDA Economic Research Service's website, June 2019.

²⁰ Plato, G. and L. Hoffman. (2011) "Price Discovery in U.S. and Foreign Commodity Futures Markets: The Brazilian Soybean Example." *Proceedings of the NCCC-134 Conference on Applied Commodity Price Analysis, Forecasting, and Risk Management*, St. Louis, Missouri.

of copper futures, the CME copper futures traded at a premium over the LME contracts between 2014 to March 2017 because of the difference in the coverage of the exchanges' warehouse networks (34 global locations for the LME but limited to US locations for the CME) and the expectation of tariffs imposed by the US²¹.

- Another study²² found that the US futures market had a larger driving force in price discovery in soybean and copper than the Chinese market and the effect of information flows from the US market to the Chinese market was stronger than the other way round. This illustrates the difference in the pricing power of commodities in the global commodity futures market.

The global commodity futures exchanges are crucial in the price discovery of commodities. The pricing power is attributable to the close linkage between commodity spot and futures markets in serving the different needs of commodity users.

2. COMMODITY FUTURES TO MEET USER NEEDS IN THE REAL ECONOMY

2.1 Different user needs in the real economy

Key participants in the global commodity futures market include hedgers and financial investors. A hedger can be a producer, consumer or trading firm and starts with a price exposure in the commodity, buys or sells futures contracts, and therefore offsets the price exposure. A financial investor starts without price exposure, buys or sells futures contracts, and therefore takes on price exposure. As they play different roles in the real economy, the products and services of the commodity futures market fit their needs in different ways.

(1) Producers

Producers in the upstream industries produce commodities as raw materials for further processing. The production usually operates throughout the year, unless it is interrupted by policy guidance on the supply or adverse climate conditions. It is quite costly and timely to restart production facilities, for example steel smelters, and it is therefore not flexible to adjust the quantities of a commodity in the production process. In other words, producers have fixed schedules of output supply. Sharp declines of the output price will turn out to be losses.

For commodity producers to hedge against the downside risk of declines in output prices, one possible way is to take short positions of physically settled futures or long put options to sell a given amount of commodity outputs at a pre-determined price at the date of output. Taking the LME market as an example, the metal contracts have prompt date structures out to 123 months to meet the production schedules that can be physically settled on a daily basis up to 3 months, on a weekly basis on Wednesdays between 3 to 6 months and on a monthly basis on the third Wednesdays between 7 months to 123 months. As producers usually want to sell their outputs evenly throughout the year at a relatively stable price, the LME's contracts that average the pricing meet their needs. Producers can also hedge through option strategies to enhance returns²³. Certain producers may hold long or short positions more than their commercial needs, in order to generate extra profits from predictions of price fluctuation (referred to as "selective

²¹ See "LME and CME copper arbitrage: When global and regional prices meet", *LME Insight*, March 2017.

²² See Liu, Q. and Y. An. (2011) "Information transmission in informationally linked markets: Evidence from US and Chinese commodity futures markets", *Journal of International Money and Finance*, Vol. 30, pp.778-795.

²³ See Taušer, J. and R. Čajka. (2014) "Hedging techniques in commodity risk management", *Agricultural Economics*, Vol. 60, pp.174-182.

hedging). They tend to take relatively more long (more short) positions in commodity futures for hedging with positively (negatively) skewed returns distribution.

Producers may still bear basis risk after hedging, which arise from the difference in the price between the commodity being hedged and the hedging instrument (e.g. due to the characteristics and quantities specified in the commodity futures contract). Nevertheless, the commodity futures price is usually a reference price for a similar type of commodity in the spot market. For example, a research paper²⁴ noted that the prices of LME contracts have become reference prices for several industrial metals in bilateral transactions.

As commodity futures meet the hedging needs of producers, producers are usually key participants in the global commodity futures market. Although producers and consumers mainly rely on the spot market to trade commodities, the efficient settlement of commodity futures transactions through physical delivery at warehouses also facilitate the transactions of commodities for commercial uses. This would strengthen the linkage between commodity spot and futures markets. The futures prices in the global market are therefore indicative of commodity market prices and global hedgers can use futures prices as benchmarks for commodity spot transactions. For example, the LME is able to gather key producers in the base metals market for price discovery — the largest global base metal hedgers gather for trading through the Ring (open-outcry) on the LME, which is assisted by other trading mechanisms. To facilitate trading, the LME has a global network of more than 650 approved warehouses in 35 locations²⁵ to provide physical delivery with minimised transportation costs.

(2) Consumers

Commodity consumers include second-tier producers using commodities as raw materials in the downstream industries or end users of commodity products. Their purchase of commodities is part of their cost of inputs. To avoid disruption of production or consumption due to shortage of inputs, they may keep certain levels of inventory. As end-products for consumption usually do not have a centralised secondary market, the changes of price tend to be less frequent. In the light of this, an unexpected increase of input prices will put pressure on their costs and hence the profits.

For commodity consumers to hedge against the upside risk of input prices, one possible way is to take long positions of physically settled futures or call options to purchase a given amount of commodity inputs at a pre-determined date. Consumers may also undergo selective hedging as in the case of producers and face basis risk for hedging as the characteristics and quantities of futures contracts may not perfectly meet their needs. In contrast to commodity producers, the schedule of commodity usage or consumption is usually different from that of commodity production. Major commodity futures markets usually provide average pricing for futures contracts (e.g. Monthly Average Futures and Traded Average Price Options (TAPOs) on the LME) to address the issue of timing mismatch. Besides, the geographical distribution of producers and consumers may be different. Major commodity futures exchanges approved a global network of warehouses of their own for physical delivery at settlement of their commodity futures. Proper management of inventories at warehouses also helps. An example is the LME's warehouse reforms during 2013 to 2016, which included linked load-in/load-out rule (LILO)

²⁴ Valiante, D., "Price formation in commodity markets: Financialisation and beyond", published on the Centre for European Policy Studies (CEPS)'s website, July 2013.

²⁵ The LME does not own or operate warehouses, nor does it own the material they contain. It simply authorises warehouse companies and the warehouses they operate to store LME-registered brands of metal. See "Presentation by HKEX Chief Operating Officer at a media workshop about London Metal Exchange update", the HKEX's news release, 7 June 2016.

and per-warehouse queue length report²⁶. These effectively reduce the chance of long queues of consumers to take out commodities from certain warehouses.

(3) Trading firms

Commodity trading firms are intermediaries between commodity producers and consumers to address their mismatches with the use of products and services in the commodity futures market. In the global markets, there are a few dominant commodity trading firms. Each of the biggest four had a revenue of more than US\$100 billion in 2018 (versus about US\$30-40 billion for the fifth one) from their businesses covering a wide range of commodities (e.g. metals, energy products, agricultural products and carbon emission)²⁷. Commodity trading firms may own upstream or downstream businesses themselves. Besides, commodity producers and consumers may ask for their help to manage the market risk of price fluctuations for their commodity holdings or transactions. To meet different needs of producers and consumers, a trading firm gather a number of different orders to take long and short positions in commodity futures at different maturities.

Commodity trading firms also play a role in financing the commodity trade²⁸. Major global commodity trading firms usually own midstream facilities (e.g. warehouses and shipping terminals) to smoothen out demand and supply shocks through holding inventories and capture some short-term arbitrage opportunities. They rely extensively on banks to finance short-term arbitrage activities and generally finance each transaction at 100% of the value of collaterals and are marked to market periodically (e.g. weekly). They also provide different forms of financing to their customers, including traditional trade credit (as receivables on the trading firm's balance sheet) and structured transactions through an "off-take agreement" among the producer, the trading firm and the bank to get prepayment for contract sales. An analysis²⁹ showed the linkages of commodity prices with bank lending and the real economy — an unexpected increase of one percentage point in China's bank lending could result in price increases of 10%-12% for some base metals, including copper, and one percentage point change in industrial production could lead to price changes of 7%-9% of aluminium, copper and crude oil. Such commodity financing activities require reliable records and proper management of inventories at warehouses.

(4) Financial investors

Financial investors include index traders and money managers (e.g. hedge funds) who treat commodity futures as an asset class. They may adopt active strategies (e.g. long-short strategy of futures) or passive strategies (e.g. through index futures or exchange-traded funds (ETFs) tracking commodity futures indices) in order to generate trading profits from arbitrage opportunities or speculation or for the diversification of equity portfolios³⁰. A study showed that adding commodity futures indices or gold futures to an equity portfolio had increased both annualised returns and risk-adjusted returns (Sharpe ratio) during bull and bear markets in the period around the Global Financial Crisis in 2008 (see Figure 4). As financial investors focus more on the short-term returns, they may

²⁶ See "Warehouse reform 2013 - 2016", webpage on the LME's website, viewed on 30 January 2020.

²⁷ Source: "Another battlefield of competition between major economies: Value chain of commodities" (〈大國競爭的另一個戰場：大宗商品供應鏈〉), published on *Huexiu.com*, 25 September 2019.

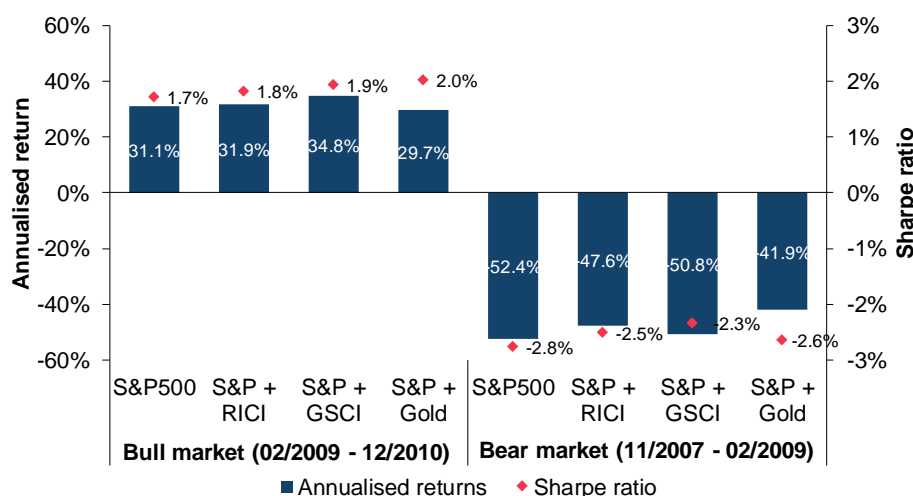
²⁸ Ditto.

²⁹ Roache, S. and M. Rousset. (2015) "China: Credit, collateral and commodity prices", *Hong Kong Institute for Monetary and Financial Research (HKIMR) Working Paper*, No. 27/2015.

³⁰ See Mayer, J. (2009) "The growing interdependence between financial and commodity markets", United Nations Conference on Trade and Development (UNCTAD)'s Discussion Paper, No.195.

prefer highly standardised futures contracts with high liquidity or cash-settled contracts to avoid physical settlement.

Figure 4. Annualised returns and Sharpe ratios of portfolios with commodity futures versus equity portfolio



Note: GSCI refers to S&P Goldman Sachs Commodity Index tracking the performance of 24 commodity futures on the CME and RICI refers to Rogers International Commodity Index tracking the performance of 38 commodity futures on nine exchanges in four countries.

S&P 500 — S&P 500 Index

S&P + RICI — A portfolio comprising 85% of S&P 500 Index and 15% of RICI

S&P + GSCI — A portfolio comprising 85% of S&P 500 Index and 15% of GSCI

S&P + Gold — A portfolio comprising 85% of S&P 500 Index and 15% of the spot gold price in the US

Source: Batavia, B., N. Parameswar and C. Wague. (2012) "Portfolio diversification in extreme environments: Are there benefits from adding commodity futures indices?", *European Research Studies*, Vol. 15, pp.33-48.

Financial investors are an important source of liquidity in the global commodity futures market. They may apply strategies with different combinations of commodity futures, options or swaps. Empirical evidence in the US on 26 commodity futures during 2 January 1994 to 1 November 2014³¹ showed that short-term position changes are mainly driven by financial investors (speculators) while long-term position changes are mainly driven by the hedging demand from hedgers³². In other words, financial investors trade more frequently than hedgers. It is suspected that speculative trading increases price volatility. However, a study³³ found that the long-short strategies of speculators in five agricultural commodity futures in the US market during 2006 to 2017 reduced market volatilities instead.

Nevertheless, financial players are the minority participant group in the global commodity market. For example, participants on the LME are mostly producers, consumers and traders, which accounted for about 75% of the trading volume of global non-ferrous metals in 2016³⁴. This explained why the turnover ratio (as measured by the ratio of annual trading volume to year-end open interest) was about 73 times in 2019 for the LME, compared to as high as over 200 times for a commodity futures exchange in the Mainland (see Section 3.2).

³¹ Kang, W., K.G. Rouwenhorst, K. Tang. (2020) "A tale of two premiums: The role of hedgers and speculators in commodity futures markets", *Journal of Finance*, Vol. 75, pp.377-417.

³² Hedgers refer to commercial traders, including producers, processors, manufacturers or merchants handling the commodity or its products or byproducts while speculators refer to non-commercial traders. "Commercial traders", "non-commercial traders" are classified in the US Commodity Futures Trading Commission (CFTC)'s Commitment of Traders (COT) dataset.

³³ Bohl, M.T. and C. Sulewski. (2019) "The impact of long-short speculators on the volatility of agricultural commodity futures prices", *Journal of Commodity Markets*, Vol. 16, pp.1-30.

³⁴ Source: "Presentation by HKEX Co-head of Market Development Li Gang at a media workshop about the overview of the Mainland China's commodities market" (Media workshop: China's commodities market — The past and present), news release on HKEX's website, 7 June 2016.

2.2 Physical delivery as a potential challenge of global commodity futures market to serve the real economy

To serve the different needs of key players in the real economy, the commodity futures market should be efficient in price discovery such that the spot and futures prices converge at the settlement date. If the futures price of a commodity deviates significantly from the spot price at settlement, it may be translated to (1) lower revenue for producers or higher cost for consumers compared to their unhedged positions, and (2) more uncertainties of investment returns for financial investors. The efficiency of physical delivery of commodities at settlement of futures contracts may be one key contributing factor to the spot and futures price convergence.

In the US, the prices of certain major agricultural futures (e.g. corn, soybean and wheat) were found to be persistently higher than the respective spot prices at settlement during 2005 to 2010 in a study³⁵. The study examined the factors contributing such non-convergence between commodity spot and futures prices. Although many thought that the cause was the excessive speculative investments of financial investors (see Section 2.1), empirical evidence showed that the costs involved in physical delivery of commodities to settle futures played a key role. One of the key factors was the difference of storage costs between the spot and futures markets³⁶ — the storage cost rate for physically settled wheat futures on the CBOT was lower than the spot market price of storage by 4.5 US cents per unit per month in 2008, which was expanded by 2.6 US cents from 2004 to 2008. In this relation, the changes of production patterns and transportation logistics affect the costs of physical delivery of commodities to settle futures. For example, the production and marketing channels of Chicago's grain market had shifted away from the Great Lakes region which was the original delivery market when the CBOT was established in the mid-19th century and became less commercially important. However, the CBOT did not revise the delivery points for corn and soybeans until 2000 and for wheat until 2009. These contributed to the expensive costs to obtain commodities for arbitrage activities during the sample period, which affected the price discovery at the futures market.

The efficiency of the commodity futures market to serve the real economy relies on the infrastructure to facilitate physical delivery of commodities to settle commodity futures, particularly the network of warehouses. Although the CME has a wide range of products, the network of warehouses may not fit global commodity users' needs. For example, copper futures can be settled physically for delivery through US warehouses only for contracts on the CME, compared to 24 global locations in the US, Europe, the Middle East and Asia for contracts on the LME³⁷. If the commodity users are closer to the network of warehouses, the transportation costs will be lower. This may facilitate the arbitrage activities for their inventories, which help price discovery of commodities.

³⁵ Adjemian, M. K. et. al. (2013) "Non-convergence in domestic commodity futures markets: Causes, consequences, and remedies", the USDA ERS's *Economic Information Bulletin*, No.115.

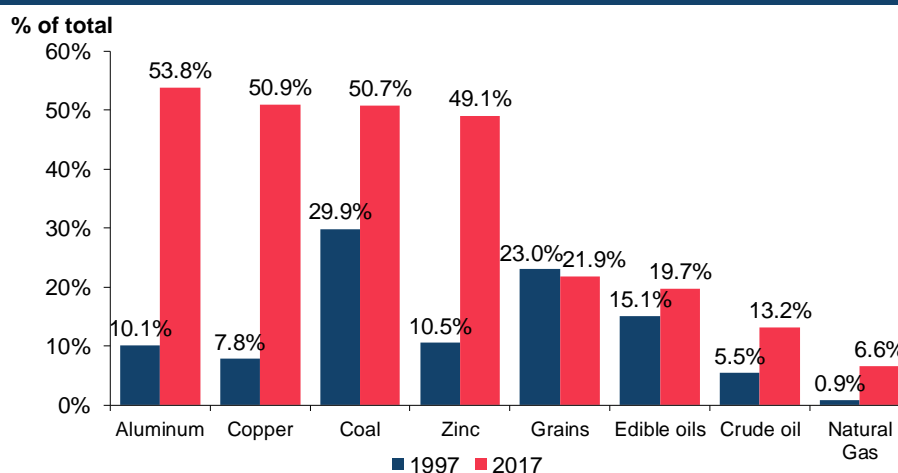
³⁶ At settlement of physically-settled commodity futures on the CME Group, warehouse receipts will be delivered to long position holders who can choose to store the commodities at exchange-approved warehouses and the exchange will collect the associated storage costs.

³⁷ The information of the CME copper futures is as of 26 March 2020 (source: "Metal warehouse stocks statistics", published on the CME Group's website, viewed on 30 March 2020) and that of the LME copper futures is as of 10 December 2019 (source: Daily data on "Stocks breakdown" webpage on the LME's website).

3. COMPARISON OF THE MAINLAND COMMODITIES MARKET WITH THE WORLD'S

In serving the real economy, the Mainland commodity futures market is considered not effective enough to meet the needs of users³⁸. With reference to the experience of global commodity futures markets, there are two main underlying reasons: first, the linkage between the Mainland commodity spot and futures markets has been relatively weak such that the futures price may not be able to serve as reference price for the spot price; second, the pricing in the Mainland commodity futures market could not exert sufficient influence on global commodity futures prices. Although China has become the largest producer and consumer of major commodities³⁹ (see Figure 5), Mainland commodity users (producers and consumers) are very often price takers of global commodity futures prices.

Figure 5. China's share of global commodity consumption (1997 and 2017)



Source: "The implications of tariff for commodity markets", *Commodity Markets Outlook*, published on the World Bank's website, October 2018 issue.

The factors contributing to above weaknesses of the Mainland commodities market vis-à-vis global developed counterparts are discussed in the following sub-sections.

3.1 A fragmented commodity spot market

Large producers who dominate the different commodity sectors in the global economy⁴⁰ would actively hedge their positions on well-established global commodity futures markets. The commodity futures prices so generated through their transactions are typically used as benchmark prices for spot transactions.

However, such a pricing mechanism is weak in the Mainland. For example, the market share of the top four companies in the steel sector accounted for about 80% of steel production in the US and Japan in 2017, compared to about 20% in the Mainland⁴¹. The Mainland spot commodities market has relied heavily on a large number of localised commodity trading firms to intermediate the trading of commodities, including agency trading and proprietary trading⁴².

³⁸ See Hu, Y. and H. Zhang. (2017) "Assessment on China's commodity futures market serving real economy", *Futures and Financial Derivatives* (《期貨與金融衍生品》), Issue no. 98, pp.16-29.

³⁹ Source: "Charts show China's explosive consumption of four critical commodities", published on *cnbc.com*, 24 September 2019.

⁴⁰ Global spot trading of a number of commodities, including aluminium, cocoa and coffee, is dominated by a few large producers. Source: Cinquegrana, P. "The need for transparency in commodity and commodity derivatives markets", published on the website of the Centre for European Policy Studies (CEPS), 15 December 2018.

⁴¹ Source: "The production chain of steel sector and the transformation in major countries — Series on steel rebar (1)" (《鋼鐵產業鏈及其背後的大國變遷 — 螺紋鋼系列(一)》), CIB Research, 27 February 2019.

⁴² See "The research report on commodity trading sector in China 2017" (《2017年中國大宗商品貿易行業研究報告》), published on the United Credit Ratings' website, 2017.

Traditionally, the spot price is set at the average processing costs in the production region plus a premium as profit margin. Further, the specification of the commodities can vary significantly across spot transactions such that there are a number of spot prices for the same type of commodities. These spot transactions may be conducted through electronic trading platforms operated by local governments, state-owned enterprises or market participants⁴³. The key participants include securities companies, futures companies and their risk management subsidiaries, and private funds. These electronic trading platforms also offer OTC derivatives trading on commodities, which may not have sound risk management framework⁴⁴. In the light of market irregularities, a policy document was issued by the State Council in 2011⁴⁵ to rectify the commodity spot market to facilitate the healthy development of the sector. The number of spot trading platforms, once rose to more than 3,000 in 2017, had been consolidated to about 30 platforms in 2019⁴⁶.

As a result of such spot trading practices, the price of a commodity in the Mainland spot market may vary across regions. These prices do not necessarily make reference to futures prices or converge to form a benchmark price and the prices discovered may not be timely to reflect current market fundamentals.

3.2 Relative dominance of speculative activities in the commodity futures market

There are currently three futures exchanges in Mainland China that offer trading in commodity futures — the Shanghai Futures Exchange (SHFE), the Zhengzhou Commodity Exchange (ZCE) and the Dalian Commodity Exchange (DCE). The trading volume of commodity futures on these exchanges are among the largest in the world. In terms of number of contracts, at least one of the Mainland exchanges was among the top five exchanges with the highest derivatives (including futures and options) trading volume for each major category of commodity in 2019 (see Figure 6).

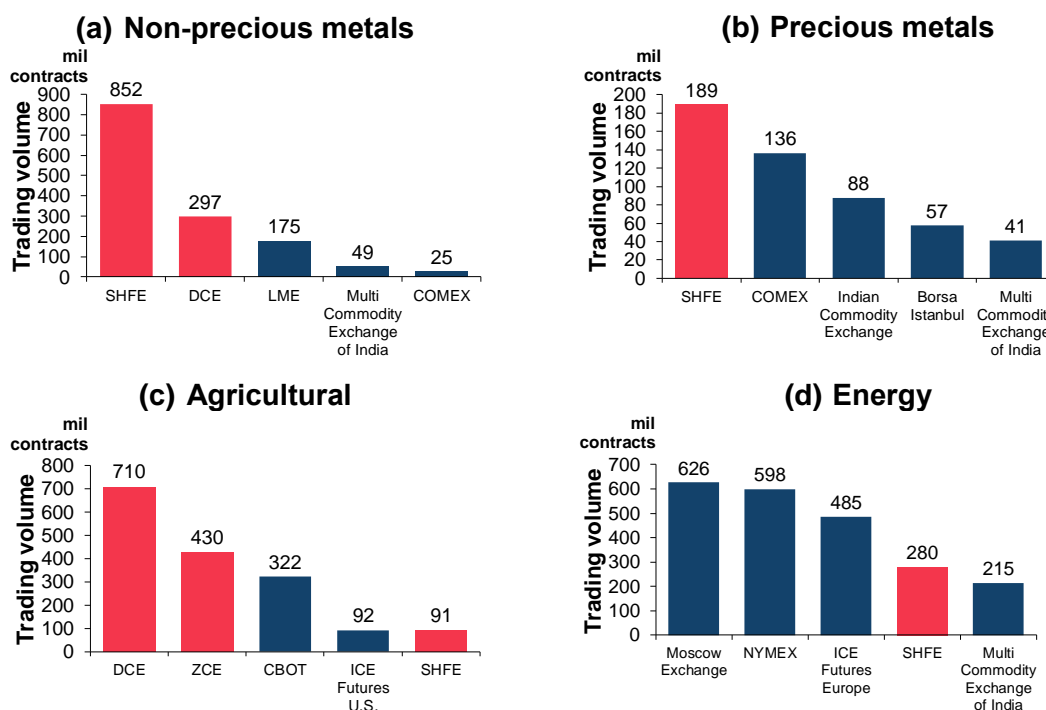
⁴³ See “The analysis and legal risk mitigation on the trading modes of commodity spot trading platforms” (《大宗商品現貨平台交易模式分析與法律風險防範》), published on *zhihu.com*, 7 December 2017.

⁴⁴ See examples given in “How do the huge losses from positions of PTA OTC options of many futures companies happen?” (《讓多家期貨公司集體穿倉的PTA場外期權爆倉事件是怎麼發生的?》), published on *yocajr.com*, 31 July 2019.

⁴⁵ *State Council's Decisions about Rectifying Various Types of Trading Venues to Mitigate Financial Risks Prudently* (《國務院關於清理整頓各類交易場所切實防範金融風險的決定》), issued by the State Council, 24 November 2011.

⁴⁶ Source: “Assessment on spot trading in 2019” (《2019年現貨貿易良心測評》), published on *yaobang-metal.com*, 20 October 2019.

Figure 6. Top 5 futures exchanges by trading volume for the major categories of commodity (2019)



Note: There is a large variation in contract sizes across markets. For instance, the contract size varies from 10 metric tonnes (MT) to 100 MT for metal contracts, from 10MT to 127MT for agricultural contracts and from 10 barrels to 1,000 barrels for crude oil contracts.

Source: FIA monthly statistics (December 2019).

Behind such high turnover volumes on the Mainland commodity futures exchanges are high turnover ratios — the annual trading volume to year-end open interest. In 2019, the ratio was 249 times for the SHFE, 247 times for the ZCE and 140 times for the DCE, compared to 73 times for the LME and 46 times for the CME Group⁴⁷ (see Figure 7). This can be interpreted as ultra-short holding time for commodities in the Mainland, implying a high degree of speculative trading. It was estimated that the average holding period of a position of steel rebar on the SHFE or iron ore on the DCE was just 4 hours in 2016 (the turnover ratios in 2016 were about 440 times and 290 times for the respective commodity derivatives on the SHFE and the DCE⁴⁸), compared to about 40 hours and about 70 hours for copper and natural gas respectively on the CME⁴⁹. In this relation, the contract sizes of futures on the Mainland commodity exchanges are usually smaller — for example, the contract size of copper futures was 5 tonnes on the SHFE compared to 25 tonnes on the LME⁵⁰.

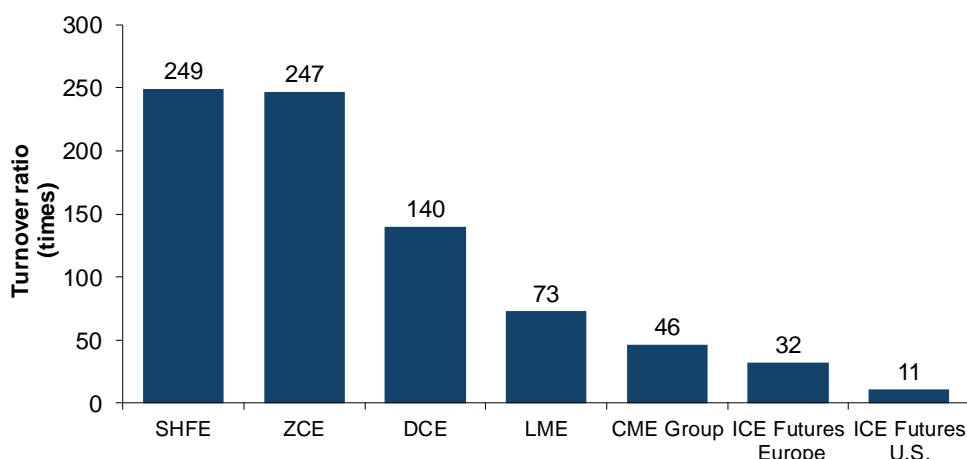
⁴⁷ Calculated from the year-to-month statistics in FIA monthly statistics (December 2019).

⁴⁸ Calculated from the year-to-month statistics in FIA monthly statistics (December 2016).

⁴⁹ Source: "A life expectancy under 4 hours shows China commodity frenzy", *Bloomberg*, 26 April 2016.

⁵⁰ See the contract specifications at the SHFE's and the LME's website, viewed on 16 December 2019.

Figure 7. Ratio of annual trading volume to year-end open interest of commodity futures and options on selected exchanges (2019)



Note: The figure for SHFE includes products on the Shanghai International Energy Exchange (INE). The figure for CME Group covers products on CBOT, CME, COMEX and NYMEX.

Source: FIA monthly statistics (December 2019).

The speculative activities may be attributable to the high proportion of retail investor participation. A study⁵¹ reported that the open interests held by individual investors' accounts was over 86% in 2016 in the Mainland, compared to less than 15% in the US. The same study suggested that individual investors are likely to have less information and more herding behaviour, which contribute to highly speculative behaviour.

The relative dominance of speculative activities and retail trading may increase price volatility of commodity futures and discourage hedging activities. Nevertheless, there are some signs of growing participation of hedgers in the Mainland futures market in recent years to counteract the dominance of retail speculative trading. Taking the DCE as an example, the share of institutional investors rose from 44% of total open interests as of end-October 2016 to 54% of total open interests as of end-July 2018⁵².

3.3 Relatively narrow warehouse network

Compared to developed commodity futures market in the world which have established extensive global warehouse networks (see Sections 2.1 and 2.2 above), the warehouse network of the Mainland commodity futures exchanges for physical settlement are relatively narrow.

Firstly, the warehouse network for the Mainland market may not be nationwide. For example, copper futures on the SHFE only provide physical settlement through 17 warehouses in Shanghai, Jiangsu, Jiangxi and Guangdong⁵³, compared to a global network of warehouses in 24 locations of copper futures⁵⁴ on the LME in the UK. Secondly, the physical settlement of commodity futures can be conducted only through the warehouses in the Mainland. Mainland companies engaged in cross-border commodity exports and imports and those with outward investments to support the projects of the "Belt and Road" Initiative (BRI) cannot have physical delivery of commodities at offshore locations for their business needs. Thirdly, the Mainland authorities have not approved any foreign commodity futures exchanges to have warehouses

⁵¹ Fan, J. H. and T. Zhang. (2020) "The untold story of commodity futures in China", *Journal of Futures Markets*, Vol. 40, pp.671-706.

⁵² Source: "The gradual change of investor composition in the futures market" (《期貨市場投資者結構悄然變化》), published on *jrj.com.cn*, 9 September 2018.

⁵³ See the contract specification of copper futures, published on the SHFE's website, viewed on 30 January 2020.

⁵⁴ "Warehouse company stocks and queue date January 2020", published on the LME's website, viewed on 20 February 2020.

in the Mainland to provide physical delivery of commodities for companies trading on their markets that have the business needs in the Mainland. An onshore hedger may trade commodity futures in the offshore markets through its subsidiary because of attractive prices, but the commodity futures can only be settled through an offshore warehouse and then imported to the Mainland. This will incur extra costs for storage and transportation (see Section 2.2) and taxes on cross-border trades (e.g. tariff and value-added tax for imports⁵⁵).

Such narrow coverage of the warehouse network for Mainland commodity futures market is costly and inadequate to meet business needs of hedgers in different locations and would disincentivise hedging through Mainland commodity futures.

3.4 Narrow product range and currency denomination

In the global commodity futures market, the underlying commodities cover the main categories of metals, energy, chemicals and agricultural products. As of January 2020, there were over 160 commodity derivatives on the CME and over 1,660 commodity derivatives on the Intercontinental Exchange (ICE), covering a wide range of asset types (see Table 1). The wide range of global commodity derivatives would fulfill the needs of different types of commodity users for different purposes, including hedging and portfolio investment. In comparison, the product range on the Mainland commodity futures exchanges is relatively narrow — just over 70 commodity derivatives, which are mostly futures (60 in number as of end-January 2020) and a few commodity options (11 in number as of end-January 2020) (see Table 1). These may not be able to serve the different industrial sectors in the Mainland.

Commodity category	ICE	CME	Mainland exchanges			
			SHFE (incl. INE)	ZCE	DCE	All
Agriculture	46	46	-	16	13	29
Energy	1,546	80	3	-	2	5
Metals	15	40	14	2	2	18
Others	58	-	6	8	5	19
Total	1,665	166	23	26	22	71

Note: Data as of 22 January 2020.

Source: Websites of ICE, CME, SHFE, DCE and ZCE.

Commodity futures on the Mainland exchanges are priced in Renminbi (RMB) only. This can meet the needs of onshore hedgers for uses in Mainland China, but not for offshore uses (e.g. in BRI projects). It is reported that a large amount of BRI-related projects were funded in USD⁵⁶. The lack of choices of foreign currency denomination may drive Mainland hedgers to use global commodity futures markets. In respect of portfolio diversification, onshore financial investors have limited choice of currency denomination for commodity exposure.

3.5 Limited market opening for global interaction

While major commodity futures markets in the world are open to free access by international investors, foreign investors' access to the Mainland commodities market is still very restricted

⁵⁵ See "Announcement No. 5 [2018] of the Customs Tariff Commission of the State Council" (《國務院關稅稅則委員會公告 2018 年第 5 號》), issued by the Ministry of Finance, 24 July 2018,

⁵⁶ See "Dollar constraints may lead to more multilateral approach for China's Belt and Road", published on *chathamhouse.org*, 23 October 2018.

and the access to overseas commodity futures markets by Mainland users is highly regulated too:

- For foreign participation in the Mainland market, only designated commodity futures are opened directly to foreign investors. As of the end of February 2020, the designated futures products are crude oil and rubber on the Shanghai International Energy Exchange (INE, an SHFE's subsidiary), PTA on the ZCE and iron ore on the DCE. For other products, trading is limited to onshore participants only, which may include certain Sino-foreign joint ventures.
- For overseas market participation by Mainland users, only a limited number of state-owned enterprises (SOEs) got official approval to participate in cross-border hedging in the global commodity futures markets⁵⁷. Alternatively, onshore commodity users can hedge in the global market through their offshore subsidiaries. However, the imports of commodities settled as a result of offshore hedging are subject to taxes and the money flows of offshore cash-settled commodity futures are restricted.

As a result, global and Mainland hedgers and financial investors are not free to participate in each other's market such that the global and Mainland commodity futures markets remain separate from each other without adequate price interactions.

An imbalance of investor participation can be illustrated by the big difference in the open interests of agricultural futures in the US and Mainland markets, given that agricultural futures in the Mainland market are currently not open to foreign participation. Despite the growing global significance of the Mainland economy, the agricultural commodity open positions through futures in the US market was significantly higher than those in the Mainland market (see Table 2). Figure 8 shows an example of the non-convergence of futures prices on the Mainland and US commodities markets in the case of soybean — the soybean futures prices in the US persistently stayed below those in the Mainland during 2008 to 2019.

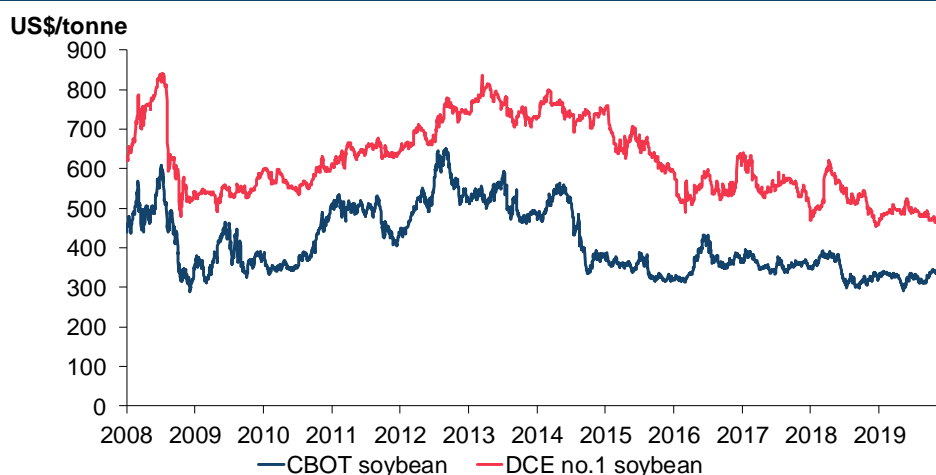
Table 2. Agricultural commodity open positions through futures in the US and Mainland China (2018)

Type of commodity	US (mil tonnes) (A)	China (mil tonnes) (B)	Ratio of (A)/(B) (times)
Wheat	114.78	0.02	5,001
Soybean meal	41.26	18.42	2
Corn	252.98	9.08	28
Soybean	116.40	1.63	71
Soybean oil	13.34	4.91	3
Grain	0.73	0.00	--
Cotton	6.17	1.05	6
Sugar	46.13	3.37	14
Total	591.80	38.69	15

Note: Data as of 13 March 2018.

Source: Xie, X. (2018) "The formation and recommendation of commodity pricing centre from historical perspective" (〈從歷史看大宗商品定價中心的形成及建議〉), *China Futures* (《中國期貨》), Vol. 65 (2018 Issue no.5), pp.51-56.

⁵⁷ Thirty-one SOEs were approved in 2016 for cross-border hedging activities. Source: "Guantao insights: SASAC cancelled the approval of offshore commodity derivative business of central SOEs" (〈觀韜解讀：國資委取消中央企境外商品衍生業務核准事項〉), published on *guantao.com*, 30 August 2016.

Figure 8. Daily prices of soybean futures on CBOT and DCE (2008 – 2019)

Note: The price of no.1 soybean futures on the DCE is converted into US dollars based on Bloomberg's USD/RMB daily exchange rate.

Source: Bloomberg.

4. HOW CAN THE MAINLAND COMMODITY FUTURES MARKET BETTER SERVE THE REAL ECONOMY?

For the Mainland commodity futures market to better serve the real economy in the same way as the global commodity futures market, firstly the linkage between the Mainland commodity spot and futures markets should be strengthened. This could facilitate the price discovery of commodities in the futures market such that the futures prices can in turn be the benchmark prices of spot transactions and commodity futures could effectively support hedging activities. Secondly, given China's dominance of global consumption and production of commodities, global interaction of the Mainland commodity futures market should be promoted such that China's pricing power in global commodities could be enhanced, which would enable Mainland commodity producers and consumers to play a part in global commodity price setting, rather than price-taking only. Possible ways to achieve these two objectives include the following:

(1) Consolidating trading and enhancing trade transparency in the spot market

The consolidation of spot trading platforms, possibly driven by policy, could enable the formation of benchmark spot prices. A larger share of localised hedgers and other market users may conduct customised transactions of commodities on these platforms. In this relation, trade transparency should be enhanced to let market users observe the price dynamics in the commodity spot market, including the price difference from the centralised commodity futures market. This may increase the incentive of hedgers to use commodity futures prices as benchmark prices for spot transactions.

(2) Enhancing regulation to combat excessive speculation

Excessive speculation leads to excessive price volatility such that the futures prices would deviate from the underlying fundamentals and the deviation would erode the effectiveness of futures as hedging tools. To curb excessive speculation, the experience of the US in implementing regulatory measures⁵⁸ suggested the possible way of banning high-frequency trading in the futures market. In a volatile market, limiting the order size and timely adjustments to lower position limit and/or to increase margin requirements could help combat excessive speculation.

⁵⁸ Berg, A. (2011) "Chapter 13. The rise of commodity speculation: from villainous to venerable", *Safeguarding Food Security in Volatile Global Markets*, Food and Agriculture Organisation of the United Nations (FAO).

(3) Expanding and strengthening the network of warehouses for physical delivery

The geographical distribution of warehouse network of commodity futures exchanges could be expanded in the Mainland in order to minimise the time and transportation cost for the delivery of commodities for onshore usage. To meet the business needs, inventories at warehouses should be managed more efficiently and effectively (e.g. through efficient load-in and load-out processes) to make the logistics schedule more predictable. To support hedging for cross-border trades, the authorities could approve more warehouses in “bonded zones” for physical delivery of commodities to settle Mainland and global commodity futures, to take the advantage of tax-free cross-border delivery⁵⁹.

(4) Widening the product range and currency denomination

To better serve the various needs of hedgers and financial investors in different sectors, the commodity futures market should have a wider range of derivative products, in terms of product type (e.g. options or swaps), underlying commodities (e.g. with more variation in specifications) and currency denomination.

(5) Further opening up the Mainland commodity futures market

Authorities may consider widening the two-way market access for more global interaction. Greater foreign participation in the Mainland market would help Mainland commodity futures prices incorporate the views of global users. Possible ways include designating more product types for direct access by foreign users, the cross-listing of Mainland products on offshore markets, expanding the scope of eligible investors to include Qualified Foreign Institutional Investors (QFIIs), RMB QFIIs (RQFIIs)⁶⁰ and other foreign users. Similarly, greater overseas participation by Mainland users can increase pricing influence of Mainland users in the global market. Possible ways include enlarging the scope of eligible Mainland users for cross-border hedging in offshore markets and the cross-listing of offshore products on the Mainland market. In addition to these, a commodities connectivity platform similar to Stock Connect and Bond Connect would be an efficient and convenient channel for opening up the two-way market access.

In respect of product varieties and market opening discussed above, the Mainland commodities market can leverage on the comparative advantage of the Hong Kong market. Complementary to Mainland commodity futures market, the Hong Kong market offers users with easy access to LME metal products in the Asian time zone. Hong Kong market could also help to gather commodity users and investors by serving as a financing centre for BRI projects of both Mainland and global enterprises. In fact, a number of Mainland and global commodity trading firms have already established offices in Hong Kong. The Mainland-Hong Kong Mutual Market Access programme may also be extended to the commodities sector to facilitate greater foreign participation in the Mainland market and vice versa. All these would facilitate the formation of an ecosystem of Mainland and global commodity users in the Hong Kong market to support the development of the commodity futures market and the further opening-up of the Mainland market.

⁵⁹ See “What’s the bonded zone?”, published on *ftz-shanghai.com*, viewed on 17 December 2019.

⁶⁰ Proposed rules amendment for opening up the access to Mainland commodity futures and options by QFIIs and RQFIIs was issued in January 2019. See *Explanation about the Administrative Measures for Domestic Securities Futures Investment of QFIIs and RQFIIs (Draft for Consultation) and Related Rules* (《關於《合格境外機構投資者及人民幣合格境外機構投資者境內證券期貨投資管理辦法(徵求意見稿)》及其配套規則的說明》), issued by the China Securities Regulatory Commission, 31 January 2019.

5. CONCLUSION

Drawing on experiences of the evolution of global commodity futures exchanges, the strong linkage between commodity spot and futures markets is fundamental in that commodity futures need to provide benchmark prices for commodities in the spot market such that they can be efficiently used to meet the hedging needs of producers, consumers and intermediaries in the real economy. Through the global network of warehouses, the commodity futures market helps reduce uncertainties on timing and provide a cost-effective alternative, in complement to the spot market, for physical delivery of the underlying commodities for commercial uses.

The Mainland commodity futures market have not been able to serve the real economy effectively in this way. In the Mainland, the price setting in the fragmented spot market, which may not come up with a standard price for a commodity, does not very often make reference to commodity futures prices. The reference value of commodity futures prices to spot prices in the Mainland may be undermined by the excessive price volatility from speculative trading activities, extra transportation costs for physical delivery through a relatively narrow warehouse network and the limited choices of product and currency denomination. These may also disincentivise hedging activities through commodity futures in the Mainland. Besides, limited market opening has led to the difference in futures prices between Mainland and global commodity markets. The Hong Kong market, being an international financial market at the front-door of China, could take the role as a super-connector in the commodities sector to further increase the global interaction of the Mainland commodity futures market, thereby help strengthening up the Mainland commodity futures market to better serve the real economy.

Remark

This research report has made reference to views and feedback on commodity market developments sought from futures companies in the Mainland and Hong Kong markets.

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