Iron Ore and Iron Ore Futures

山證國際
SHANXI SECURITIES INTERNATIONAL

资产管理| 公募基金 | 海外投资

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1：What is Iron Ore

Demand for iron ore

Supply of iron ore

Iron ore price

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DCE Iron Ore Futures Contract

What is Iron Ore

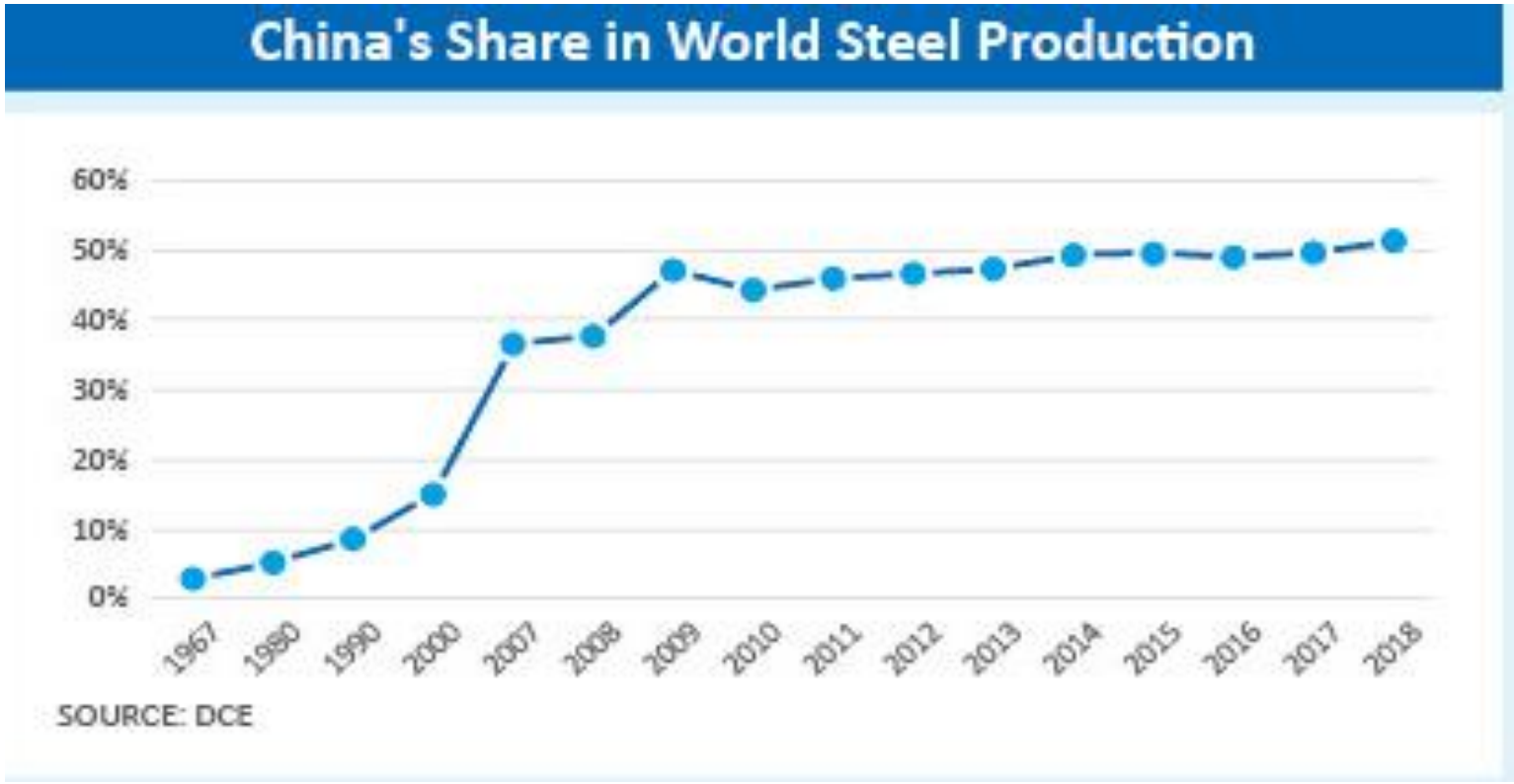
- Iron ore refers to the ore that contains iron element or iron compounds. It has industrial use value and is the important raw material for iron and steel iron-making mainly including magnetite (Fe_3O_4), hematite (Fe_2O_3) and siderite ($FeCO_3$).
- There are many varieties of iron ore and ore products are selected from natural ore through procedures such as crushing, grinding, magnetic separation, flotation and re-selection. It takes about 1.6 tons of iron ore to produce 1 ton of cast iron. Iron ore is graded according to origin, grade and purity.
- The grade of iron ore represents the content of iron element in the ores. According to different physical forms, the iron ore family is divided into raw ore, lump ore, fine ore, ore concentrate, sinister ore and pellet ore. The finest ore is selected as the underlying product for iron ore futures trading on DCE.

Demand of Iron Ore

- **Steel mills are end-users of iron ore and steel productivity determines iron ore consumption. From 2010 to 2017, global iron ore consumption increased by 15.25% with an average annual growth rate of 2.21% and the growth of iron ore consumption in Mainland China and India increased by 21.38% and 70.24%, respectively.**
- **For China, in 2008, cast iron output was 469 million tons and the demand for iron ore was approximately 750 million tons. By 2017, cast iron outputs was 711 million tons and iron ore demand was 1.14 billion tons.**

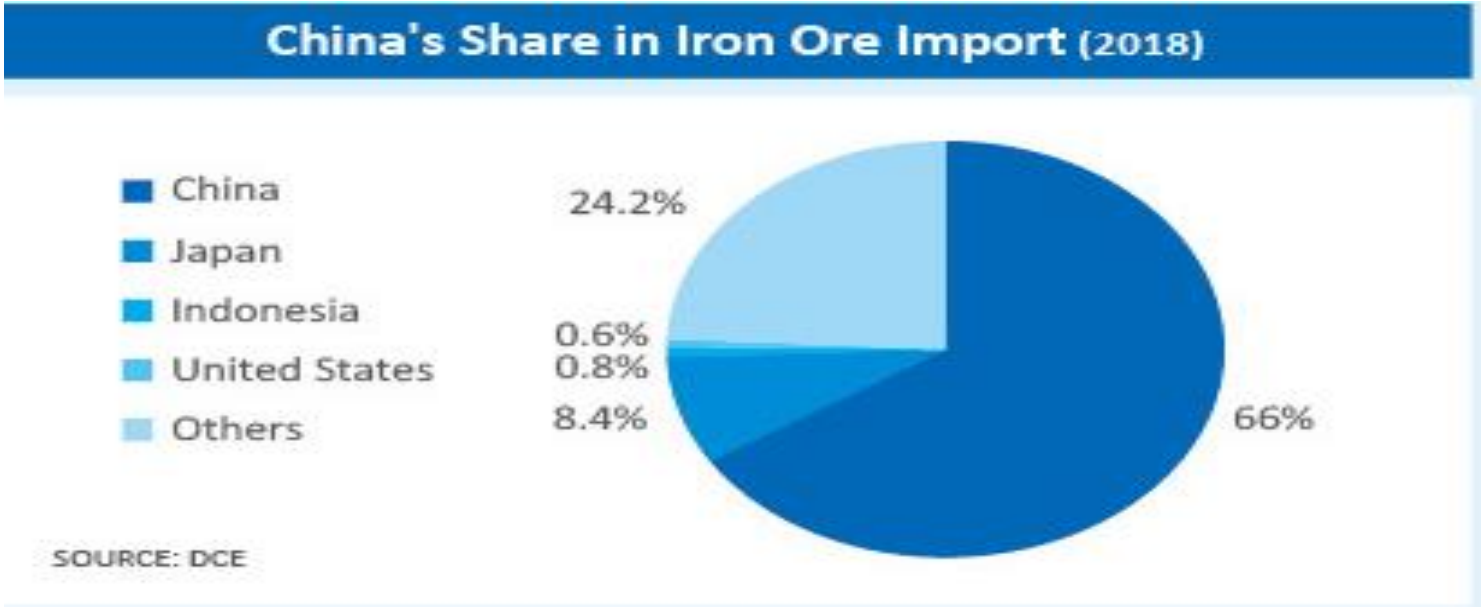
The Importance of Iron Ore to Mainland China

- **The iron and steel industry is an important pillar for Mainland China's economy as it is closely related to a wide range of industries. The industry plays a significant role in many sectors such as in economic construction, social development, fiscal taxation, national defence and employment stability. Since 2000, China took on a more prominent role in the global production of steel; its contribution in global steel production increased from less than 10% in 1967 to close to 50% of the global production of steel in 2009 and maintained at that level through to 2018.**



The Importance of Iron Ore to Mainland China

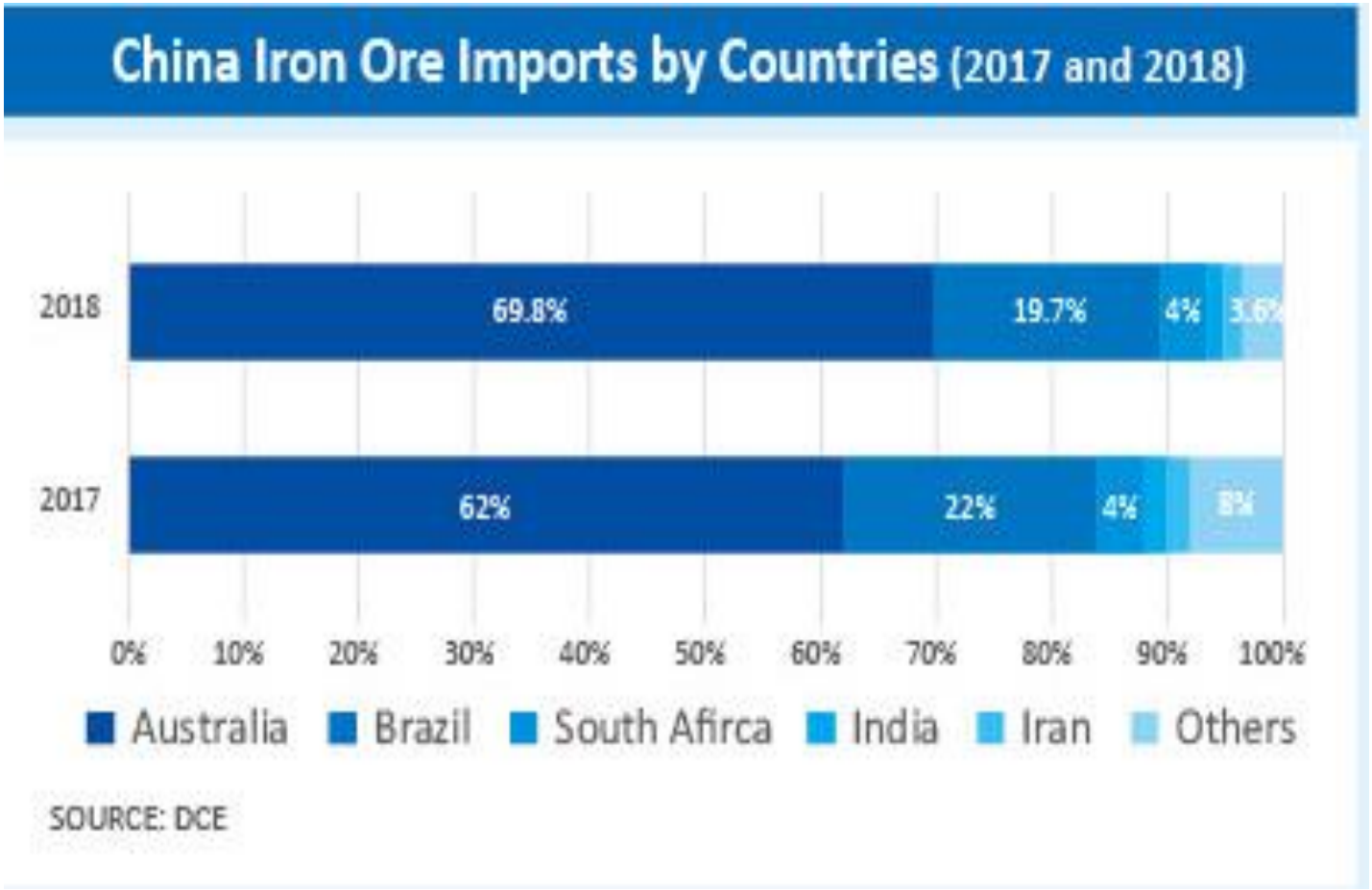
As distribution of the global steel production is inconsistent with the distribution of iron ore resources, major steel producing countries and regions, such as Japan, South Korea, the United Kingdom, Italy and Mainland China, import large amounts of iron ore to meet the scale of their steel production. In China, the local supply of domestic iron ores cannot meet the requirements of steel production due to insufficient and low quality output. Hence, there is a strong need for imports of high-grade iron ores in Mainland China. As a result, China is a major importer of iron ore; in 2018, China' s import of iron ore amounts to 66% of global imports which is more than double the amount of iron ore imported by Japan, the second highest iron ore importer in the world.



The Importance of Iron Ore to Mainland China

The import volume was stable during 2015 to 2018 at approximately 1 billion tons per year. Australia, Brazil and South Africa are the top 3 countries of Mainland China’ s iron ore imports in 2017 and 2018.

The Importance of Iron Ore to Mainland China



Supply of Iron Ore

- As iron ore consumption increases, global output also increases to meet the demand. From 2002 to 2011, the overall global output of iron ore increased by 1.05 billion tons with annual growth of approximately 105 million tons which is equivalent to 8.49% average annual growth rate.
- In 2012, influenced by the price fluctuation of iron ore, global output declined to 1.90 billion tons, the first decline since the financial crisis. As iron ore prices stabilised in 2016, even small and medium-sized mines resumed production. In 2017, the annual global output reached 2.20 billion tons.
- South America, Asia and Oceania are the main sources of increase in global iron ore supply. From 2008 to 2015, the annual growth rate of iron ore output (raw ore output) was more than 40 million tons in Australia. The top 10 countries producing iron ore accounts for more than 80% of global production. The world’s high grade iron ore mines are found in Australia and Brazil.
- The four largest iron ore production companies in the world include Rio-Tinto, BHP Billiton, FMC in Australia and VALE in Brazil. These key suppliers dominate the iron ore market and control more than 70% of the iron ore export market. Key suppliers continue to commission the building of new mines in 2015 and 2016 to increase production by 2017. Since world supply of iron ore is heavily dependent on these key suppliers, disruption in supply in any one of these suppliers will impact global iron ore prices.

Iron Ore Prices

- **Before 2008, global iron ore prices were negotiated by the key suppliers mentioned above with their major traders for one-year contract periods. In 2010, VALE changed the annual pricing mechanism to adopt an index-based method for quarterly pricing, which gradually transformed to the monthly pricing mechanism commonly adopted today. The major reference for pricing adopted by mining companies is the Platts Index.**
- **As a raw material for iron and steel production, iron ore prices are affected by the cost of mining the raw material (such as equipment cost, labour cost, cost of water, electricity and/or freight). Since iron ore is an international bulk commodity, its price is also influenced by policy factors, such as import and export duties. Productivity and output fluctuations, inventory changes, changes in downstream demands and macroeconomic and financial conditions (such as exchange rates) also influence market prices of iron ore.**

Iron Ore Prices

- **By the end of October 2018, the spot price of iron ore was RMB 605 per ton, which went up by 9.8% from the beginning of 2018. Compared with 2017, the spot price of iron ore did not fluctuate much in 2018, with the annual price fluctuation of 30.39%, and the annualised daily volatility of 17.35%.**

Iron Ore Futures and Financial Market

- Market participants not only buy and sell physical quantities of iron ore, but also trade contracts for the future delivery of iron ore and other commodity derivatives. One of the roles of futures markets is price discovery, and as such, these markets play a role in influencing iron ore prices.
- Iron ore market trading activity involves a range of participants with varying motivations, even within individual participants. Some, such as iron ore producers, have a significant commercial exposure to changes in the price of iron ore, and may seek to hedge their risk by buying and selling iron ore derivatives. For example, an iron ore producer may want to enter into iron ore futures and swaps to secure long term fixed sales price to lock in revenue and to hedge against iron ore price drops
- Banks, hedge funds, commodity trading advisors, and other money managers who often do not have interests in trading physical iron ore are also active in the market for iron ore derivatives to try to profit from changes in prices. In recent years, investors have also shown interest in adding commodities as alternatives to equity and bond investments to diversify their portfolios or to hedge inflation risks.
- Banks, hedge funds and other "non-commercial" investors can add liquidity to futures and derivative markets by taking the other side of transactions with commercial participants. On the other hand, concerns have been raised that non-commercial commodity trading and investment may amplify price movements, particularly at times when momentum is running strongly in a particular direction.
- In addition to iron ore futures on the DCE, which is discussed below, Singapore Exchange Limited (SGX), Chicago Mercantile Exchange (CME) and HKEX also trade iron ore derivatives, which are based on the Platts 62% CRF index with cash delivery implemented.

DCE Iron Ore Futures Contracts

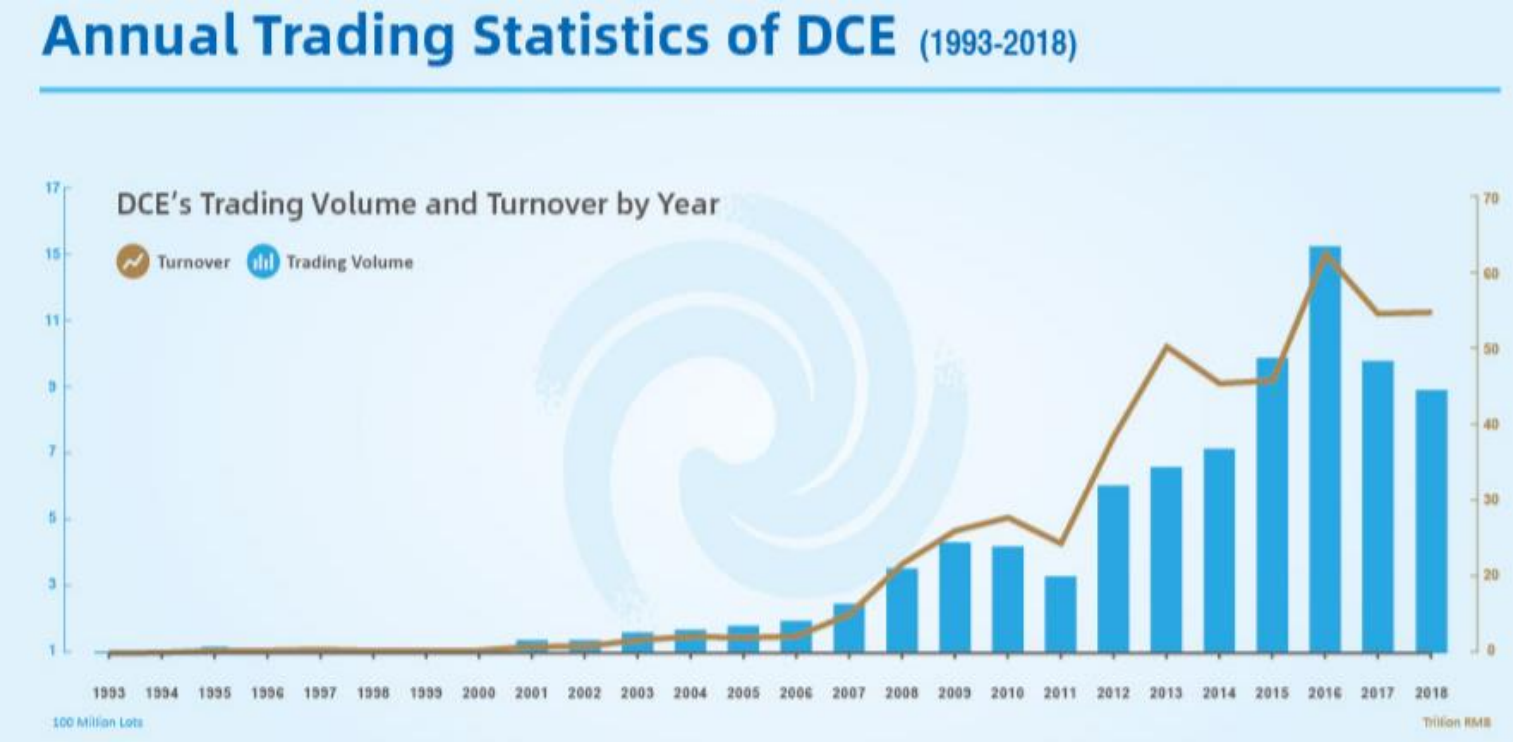
- In 2013, the DCE launched iron ore futures with 62% iron content as the quality requirement of the standard for the traded product, with physical delivery implemented.
- DCE Iron Ore Futures Contracts have the following characteristics:
- (a) The trading unit of DCE Iron Ore Futures Contracts is in increments of 100 metric tons per lot. The daily price limit is 6% to 8% of the last settlement price.
- (b) DCE Iron Ore Futures Contracts are monthly contracts. There are 12 contracts per year.
- (c) Market participants can trade DCE Iron Ore Futures Contracts on the DCE from Monday to Friday 9:00am to 11:30am and 1:30pm to 3:00pm (Beijing time).
- (d) Trading of futures in its delivery month ceases on the 10th trading day. The last delivery day is the 3rd trading day after the last trading day.

DCE Iron Ore Futures Contracts

- **DCE Iron Ore Futures Contracts have the following characteristics: (cont’ d)**
- **(e) The minimum trading margin of DCE Iron Ore Futures Contracts is 5% of the contract value. The margin will increase to 10% of the contract value from the fifteenth trading day of the month immediately preceding the delivery month and thereafter will increase to 20% of the contract value on the first trading day of the delivery month.**
- **(f) When unilateral positions of one DCE Iron Ore Futures Contract are greater than 400,000 lots, the maximum position limit of a single market participant in such contract shall be 10% of the unilateral positions of the contract. When unilateral positions of one DCE Iron Ore Futures Contract are less than 400,000 lots, the maximum position limit of a single market participant in such contract shall be 40,000 lots.**

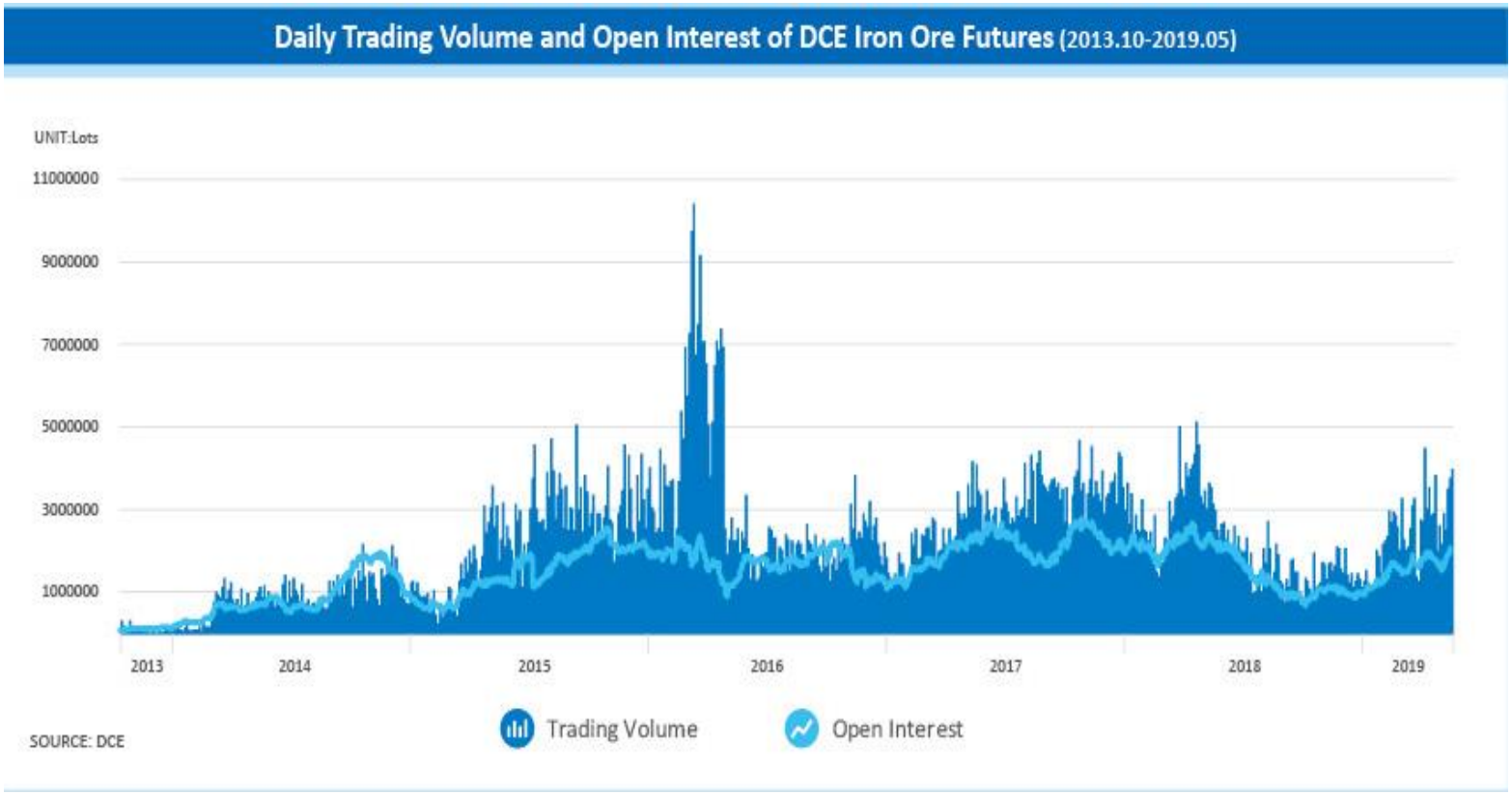
Trading Volume of DCE Iron Ore Futures Contracts

- **Since its launch in 2013, DCE Iron Ore Futures Contracts have evolved as a highly regarded futures product in Mainland China. Based on Mainland China iron ore spot market, DCE Iron Ore Futures Contracts mimic a 0.98 correlation with the spot market. Hedging efficiency of contracts could be as high as 95%. DCE Iron Ore Futures Contracts are regarded as a reliable hedging instrument for industry participants.**



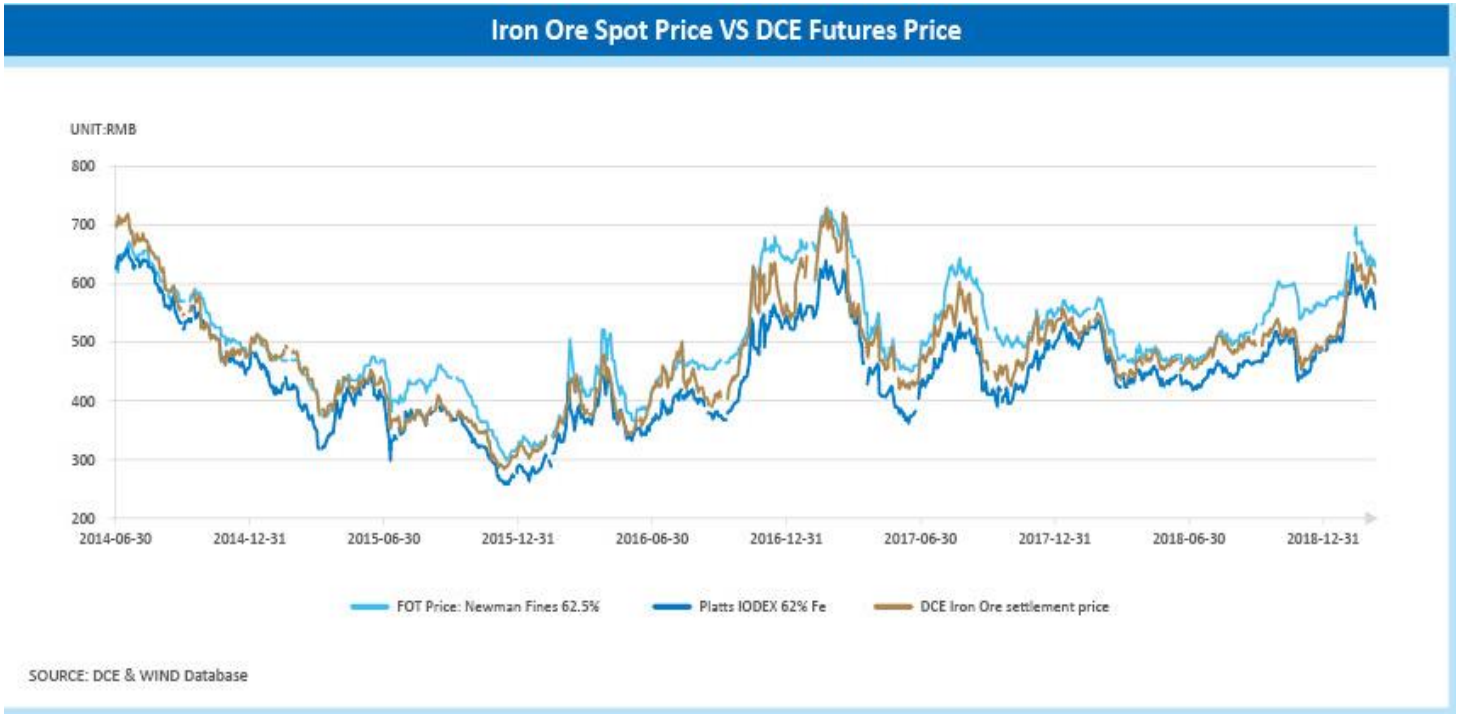
DCE Iron Ore Futures Contracts

- **In 2018, the annual trading volume of DCE Iron Ore Futures Contracts is 982 million lots with annual turnover of RMB 52 trillion while its average daily open interest is 5.88 million lots.**



Correlation with Spot Price

- **An analysis by Gelin Dahua Futures Co., Ltd of iron ore spot price and DCE Iron Ore Futures Contract price shows that when the market is active, DCE Iron Ore Futures Contracts prices lead iron ore spot prices. DCE Iron Ore Futures Contracts prices lead iron ore spot price's volatility: futures price peaks and troughs, then iron ore spot prices follow the trend set by the price of futures. However, when the market is less active, iron ore spot prices lead the price of the futures market. In terms of price volatility, the volatility of futures price is usually higher than the fluctuation of iron ore spot prices.**

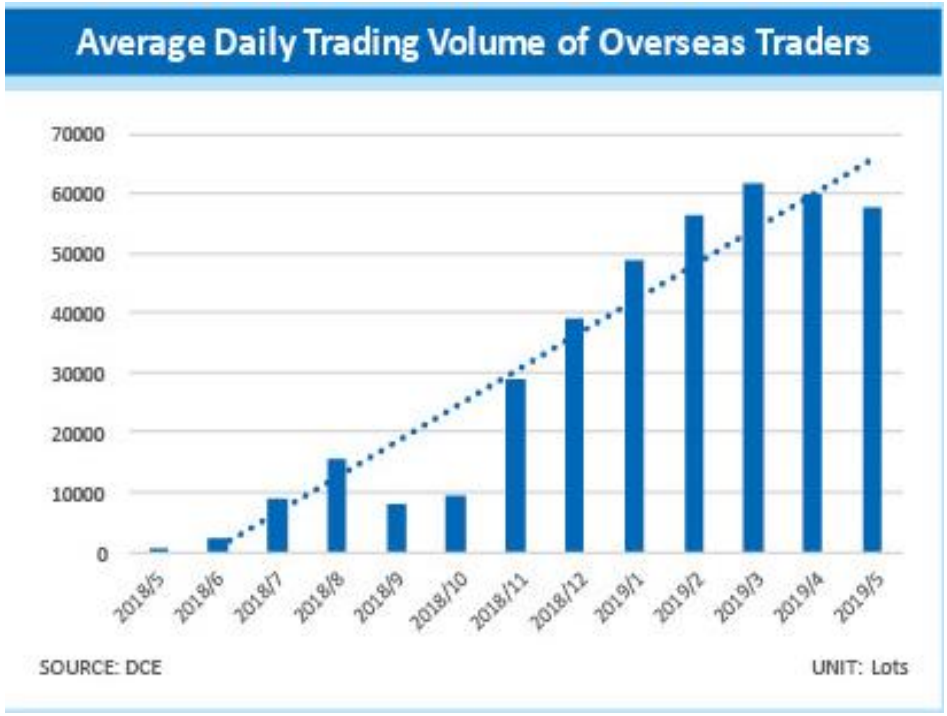


Internationalisation of DCE Futures

- **On 4 May 2018, DCE launched a scheme of arrangement under the regulation of the CSRC, which enables overseas traders and brokers to participate in the trading of Mainland Chinese iron ore futures.**
- **As part of the Scheme, DCE enacted related regulations imposing suitability and threshold requirements on overseas traders. In order to open an account to trade on the DCE, potential participants must satisfy capital, compliance and competency requirements in the trading of futures contracts. Please refer to the section headed "10. Investment in DCE Iron Ore Futures Contracts – Account Opening" below for further information on the Scheme, including the arrangement on account opening.**

Internationalisation of DCE Futures

- As of 30 June 2019, there were approximately 45 overseas brokers from 6 countries registered with the DCE through 32 domestic futures companies. A total of 134 overseas clients from 13 countries and regions opened accounts and 84 of them participated in the trading of DCE Iron Ore Futures Contracts.
- Since overseas trader were granted access to DCE Iron Ore Futures Contracts, trades have steadily increased reaching an average of approximately 60,000 lots per day. 。



2： DCE Iron Ore Futures Price Index

Index Compilation

Index provider

Roll-over

The underlying index and futures roll

- The Underlying Index of the SSIF DCE Iron Ore Futures Index ETF is the DCE Iron Ore Futures Price Index. The DCE Iron Ore Futures Price Index is a compiled and published by the DCE, and tracks the price of DCE Iron Ore Futures Contracts.
- The Underlying Index was launched on 7 April 2017 and had a base level of 1,000 on 18 October 2013. The Underlying Index is denominated in RMB (CNY).
- The Manager and each of its Connected Persons are independent of the Index Provider.
- The Underlying Index is comprised of DCE Iron O
- re Futures Contracts listed on the DCE. The specific DCE Iron Ore Futures Contracts included in the Underlying Index is the main DCE Iron Ore Futures Contract, which is the DCE Iron Ore Futures Contract with the largest open interest, and if there are two DCE Iron Ore Futures Contracts with the same open interest, then main DCE Iron Ore Futures Contract would be the contract with the larger trading volume. If there are two DCE Iron Ore Futures Contracts with same open interest and trading volume, then the one with a later expiry month would be the main DCE Iron Ore Futures Contract.
- Information on the constituents of the Underlying Index is available on http://am.ssif.com.hk and will be updated after each rebalancing on a retrospective basis and in advance of the next rebalancing.

The underlying index and futures roll

- The Underlying Index incorporates a methodology for the replacement (also referred to as “rolling”) of the main DCE Iron Ore Futures Contract with the next main DCE Iron Ore Futures Contract.
- On the closing of each trading day of DCE, the main DCE Iron Ore Futures Contract is determined using the criteria mentioned in “General Information” above.
- The Underlying Index gradually reduces the weighting of the main DCE Iron Ore Futures Contract and increases the weighting of the next main DCE Iron Ore Futures Contract over a five consecutive business day period so that on the first day of the roll-over period the main DCE Iron Ore Futures Contract represents 80% and the next main DCE Iron Ore Futures Contract represents 20% of the Underlying Index, and on the 5th day of the roll-over period the next main DCE Iron Ore Futures Contract represents 100% of the Underlying Index.
- If, on the last trading day of DCE two months prior to the settlement date of the then main DCE Iron Ore Futures Contract, no new main DCE Iron Ore Futures Contract is identified, there will be a mandatory rolling. In such circumstance, the then main DCE Iron Ore Futures Contract will be rolled-over to the next main DCE Iron Ore Futures Contract with a later expiry month (i.e. the DCE Iron Ore Futures Contract with the second largest open interest and with a later expiry month), over a 5-day roll-over period mentioned above.

3：Impact of Rollovers on Index and ETF Prices

Contango and backwardation

Contango and backwardation

- **The Underlying Index is composed of DCE Iron Ore Futures Contracts. As and when a new main DCE Iron Ore Futures Contract is determined, it is replaced by the next main DCE Iron Ore Futures Contract which may be at different price.**
- **This process is referred to as "rolling". Excluding other considerations, if the market for these Futures Contracts is in "contango", where the prices of the new main Futures Contracts are higher than those of the older main Futures Contracts, the sale of the old main Futures Contract would take place at a price that is lower than the price of the new main Futures Contract.**
- **Accordingly sale proceeds when rolling (selling and then buying DCE Iron Ore Futures Contracts) will not be sufficient to purchase the same number of DCE Iron Ore Futures Contracts which have a higher price, thereby creating a negative "roll yield" which adversely affects the Net Asset Value.**

Contango and backwardation

- By contrast, if the market for these Futures Contracts is in "backwardation", where the prices of the new main Futures Contracts are lower than those of the older main Futures Contracts, the sale of the old main Futures Contract would take place at a price that is higher than the price of the new main Futures Contract, thereby creating a positive "roll yield".
- Contango or backwardation could last for an undetermined period of time. Iron ore has at times in the past traded in contango due to material storage costs of iron ore, as well as high demand of iron ore.
- Because roll yields are considered in the calculation of the Underlying Index, the presence of contango in the commodity markets could result in negative "roll yields", which could adversely affect the level of the Underlying Index, the Net Asset Value and reduce the value of the Unitholders' investment.

Contango or Backwardation

- **Contango and/or backwardation are caused by many factors such as:**
  - **Carrying Costs**
    - **Carrying costs consist of financial, storage, and insurance costs which are required to store the relevant commodity. Some commodities, such as natural gas and crude oil, are known for exhibiting steep contango over time as the carrying costs associated are relatively high compared with other commodities.**
  - **Market supply and demand of the delivery month**
    - **For agricultural products, during September in the harvest season when shipment of the harvests takes place, the expected increase of supply influences the drop in price. If the expected supply is to increase, backwardation occurs where futures price is lower than the spot price.**
  - **Convenience yield**
    - **Convinience yield refers to a benefit or premium with holding raw material inventory, rather than the contract or derivative product. It stems from the availability of timely physical delivery. In an inverted market, the holding of an underlying good or security may become more profitable than owning the contract or derivative instrument, due to its relative scarcity versus high demand.**