



## How Far is Shanghai INE Crude Oil Futures from an International Benchmark in Oil Pricing?

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### 1. Introduction

As the world's largest importer and second-largest consumer of crude oil, China launched its own crude oil futures (See Appendix) at the Shanghai International Energy Exchange<sup>1</sup> (hereinafter INE) on March 26th, 2018, with some medium-sulfur crude oil priced and traded in Chinese yuan (hereinafter RMB). The deliverable crude oil of Shanghai INE is mainly from China's Shengli crude oil and six other varieties of crude oil from the Middle East. The oil depots are distributed along the coast of China since the varieties traded are only seaborne not through pipelines. After its launch, the volume<sup>2</sup> of INE futures have exceeded that of DME<sup>3</sup> Oman crude oil futures, becoming the third active crude oil futures worldwide<sup>4</sup>.

The unique RMB-priced futures might be a game changer. China intends to price the world's most-traded commodity and play a bigger role in global oil trading, while the U.S. dollar used to be the main currency for oil futures contracts. Yet it still has far to go to enter the petro-yuan age,

<sup>1</sup> The Shanghai International Energy Exchange (INE) is a branch of the Shanghai Futures Exchange (ShFE).

<sup>2</sup> Volume represents the total amount of trading activity or contracts that have changed hands in a given commodity market for a given period, usually a single trading day.

<sup>3</sup> Dubai Mercantile Exchange Limited, DME.

<sup>4</sup> From March 26-April 24, the number of average daily open interest contracts was 205,041 for WTI, 180,575 for Brent, 189 for Oman and 5,552 for Shanghai INE. During the same period, the number of average daily volume contracts was 50,744 for WTI, 72,818 for Brent, 150 for Oman and 30,771 for Shanghai INE, according to EIA. [https://www.eia.gov/petroleum/weekly/archive/2018/180425/includes/analysis\\_print.php](https://www.eia.gov/petroleum/weekly/archive/2018/180425/includes/analysis_print.php)

the goal of establishing an Asian benchmark that will reflect the consumption and demand pattern of China and more broadly Asian is quite clear. Sooner or later, China would speed up the opening-up of its capital market and enhance RMB internationalization, too.

This month, INE crude futures are going to celebrate its first-year birthday. How far is INE crude oil futures from an international benchmark in oil pricing? Such an ongoing question grows with the uncertainty towards the future of INE, which is a part of China financial structural reform.

## **2. Asia-Pacific Region lacks its own crude oil benchmark**

At present, the global crude oil market has obvious geographic pattern with West Texas Intermediate (hereinafter WTI), the underlying commodity of New York Mercantile Exchange's (hereinafter NYMEX) oil futures contracts, and the North Sea Brent Crude Oil Futures Contract (hereinafter Brent), formed by the Intercontinental Futures Exchange (hereinafter ICE), and the DME Dubai contract (hereinafter Dubai). Among the three, WTI crude oil and Brent crude oil are the world's first-class benchmark crude oil, while Dubai crude oil is still in the subordinate status as second-class benchmark crude oil.

The Suez Canal divides the global oil market into two regions: the eastern and the western. For the western region, WTI is functioned to reflect the market condition of North America market, and Brent is usually referred to by the European market.

The situation in the Eastern is more complicated. It can be further divided into the Middle East market (supply center, e.g. Dubai), Southeast Asia market (trade center, e.g. Singapore), and Northeast Asia market (consumer and product oil supply place, e.g. China). As the largest supply area, the Middle East's supply share to the Western region is not much, while that to China, India, Japan, South Korea and other Asian regions continues rising. Although it is at second-class, Dubai crude oil and its sister oil product, Oman crude oil, are functioned as the benchmark for nearly all the Eastern region market.

The current pricing situation is not beneficial to Asian-pacific region, especially to China, the biggest buyer of oil. Reasons are as followed. In the Asia-pacific area, the supply-demand relation is seriously imbalanced. It has a large population with great energy demand surpassing North America and Europe since 2004 but has quite small crude oil production. That results in high dependency on imported oil. For China, its dependence on imported oil has reached 68.6% in 2017, while that number was 51.9% in 2009<sup>5</sup>.

Obviously, the crude oil supply-and-demand condition varies from that of Middle East. Dubai price is not seen as the most suitable source of market pricing for the other parts of Eastern

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<sup>5</sup> Report "Development of Oil and Gas Industry at Home and Abroad in 2017" by China National Petroleum Corporation Economic and Technological Research Institute.  
<http://news.cnpc.com.cn/system/2018/01/17/001675468.shtml>

region outside the Middle East. In addition, it is not favorable to be a price acceptor in a passive position as the supplier of the Middle East, Organization of Petroleum Exporting Countries (OPEC) is often turbulent due to historical and geopolitical reasons, causing instability and uncertainties in the oil supply and pricing processes.

Therefore, Asia-pacific market should have its own independent crude oil market with benchmark crude oil futures which provide pricing benchmarks and risk aversion tools for crude oil related infrastructure and commercial activities. Adjustment towards the market preference changes could be made in time then.

Although India, Japan and Russia had made attempts to gain the status as regional crude oil pricing centers by listing and trading crude oil futures, but most of them ended up being stuck at a plateau due to certain disadvantages.

Also, crude oil futures can make industrial funds and financial capital closely integrated. Crude oil prices are closely related to macroeconomics, industrial policies, geopolitics, and speculative funds. International oil producers, traders and consumers use the derivatives of crude oil and its downstream products to manage forward price risks, while financial funds use crude oil futures as an important category of asset allocation regarding its low correlation with stocks and bonds.

Therefore, it is reasonable for China to list its own oil futures and promote the usage of RMB in crude oil transaction for payments, in order to speed up the opening-up of Chinese capital account. Also, shifting just part of global crude oil trade into RMB will strengthen the RMB liquidity in the global market. If successful, it could also push forward shifting other product payments in RMB, such as metals and mining raw materials.

### **3. Establish the China price: The second-time of opening the crude oil futures market**

China once failed in launching crude oil futures. The first time for China to introduce the oil futures products dates to the early 1990s (See Table 1). Nanjing Oil Exchange opened in 1992 and listed the first oil futures in 1993, along with Shanghai, Beijing, Guangzhou and other oil futures exchanges launching the futures products subsequently. However, in April 1994, the State Council called for a moratorium on those oil futures, which were still in their infancy, instead introduced a policy to reform the national oil circulation system: The imported crude oil and refined oil products would be uniformly allocated and priced by the State. Over a decade, the price of China's crude oil is directly determined and adjusted by the National Development and Reform Commission (hereinafter NDRC) with the reference to the international prices.

The second-time launch of Chinese crude oil futures is well prepared by Chinese government. After nearly 10 years with a much more strengthened economical condition, China's government decided to restart the oil futures in 2014. This time, it started with the fuel oil, the

most market-oriented one among all the petroleum products. In 2004, Shanghai Futures Exchange (hereinafter ShFE) launched its first fuel oil futures. With the successful experience from fuel oil futures, the introduction of Shanghai crude oil futures was actively planned. On the Fourth National Financial Work Conference in 2012, Mr. Guo Shuqing, the Chairman of the China Securities Regulatory Commission (hereinafter CSRC), officially proposed that “China will launch the third global oil futures market to compete for oil pricing power”.

Carrying out futures trading requires an advanced level of marketization. The biggest doubt for China in the launch of crude oil futures is its highly concentrated crude oil market, which is dominated by the three biggest National oil companies, which are PetroChina Company Limited, Sinopec Group, and China National Offshore Oil Corporation.

What cannot be rejected is that promoting the RMB’s free convertibility in capital account has already become a major issue in China's financial reform. After realizing the RMB’s free convertibility of the current account in 1996, China began to steadily promote the RMB’s free convertibility of capital account and the pace of it has accelerated in recent years. In July 2015, the central bank canceled the quota limit for overseas institutions to invest in China's bond market. In February 2016, the central bank again made substantial adjustments and reforms in terms of relaxing market access management, including expanding the scope of overseas investors. In July 2017, the northbound trading through Hong Kong-Shanghai Bond Connect<sup>6</sup> was allowed.

Take that background into consideration, it can be inferred that after a long-time preparation, establishing INE crude oil futures is a part of promoting the capital account liberalization, and positioned as an international market open to investors around the world since the inception.

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<sup>6</sup> The regime allows Hong Kong and foreign investors to trade certain mainland-listed bonds from Hong Kong Stock Exchange.

**Table 1: China Oil Futures Market Sequence**

<b>Time</b>	<b>Events</b>
1992	Nanjing Oil Exchange launched the first crude oil futures
1993	Shanghai and other cities opened Oil Exchanges
1994	Crude oil futures exchanges were shut down in succession
2004	Shanghai Futures Exchange relaunched its first fuel oil futures
2006	Willingness for restarting crude oil futures became increasingly strong
2012	The Futures Trading Regulations were amended and foreign investors could trade
2013	CSRC approved and officially established INE
2014	CSRC agreed to list crude oil futures
2015	CSRC announced the document named Administration of Futures Trading for Overseas Traders
2017	CSRC clarified the trading regulation of INE
2018 March 26th	Shanghai INE Crude oil futures were officially listed

#### **4. The performance of INE crude oil futures**

##### **(1) INE crude oil futures became a hit immediately after its launch**

The timing of establishing INE crude oil futures is well planned with several advantageous factors strengthening its launch in 2018. First is the politically active prospective of China's crude oil market. In view of the strategically increasing reserve of the crude oil, the imports volume has continued rising in recent years. During the past 6 years, the crude oil import volume increases year by year. In 2017, China and spent 11.02 billion yuan importing 419.57 million tons of crude oil, which increased by 42.7% and 10.1% separately compared with 2016<sup>7</sup>. The gap between the average daily demand of 11.5 million barrels and the average output of 4 million barrels in 2016 makes China the world's largest oil importer. U.S. Energy Information Administration (hereinafter EIA) predicted that by 2030 China will replace the United States and become the world's largest oil consumer<sup>8</sup>.

Second is the construction of bonded crude oil depots which guarantee China futures delivery. China has a large number of crude oil bonded depots that have been completed or can be put into use in near future as import terminals in Ningbo, Zhoushan, Qingdao and Dalian, which are important transit points for oil companies in the North East Asia region.

Third are the sufficient domestic potential participants. Opening the right for non-nation-owned companies to import crude oil contributes to the market activities. According to the Ministry of Commerce, the total import quota for 32 non-state-owned enterprises reached

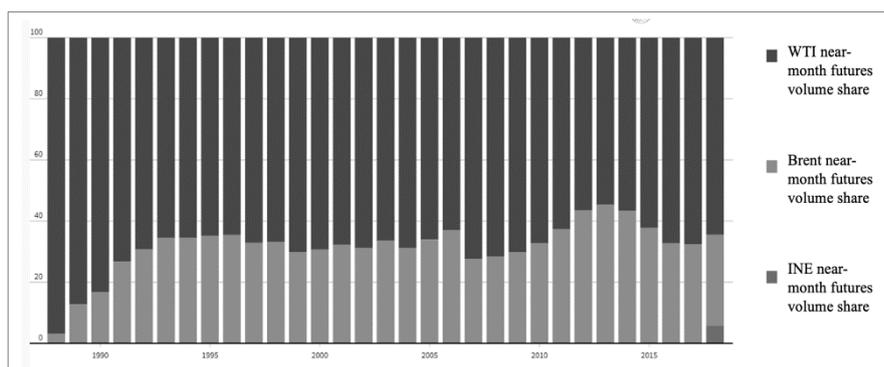
<sup>7</sup> CNPC, <http://news.cnpc.com.cn/system/2018/03/15/001681156.shtml>

<sup>8</sup> U.S. Energy Information Administration (EIA), <https://www.iea.org/weo/china/cn/>

22.92 million tons, an increase of 4.7% compared with 2016.

With the advantages mentioned above, the INE crude oil futures immediately became a hit after it came out. In June 2018, three months after its launch, INE's RMB-denominated crude oil futures contracts exceeded Dubai Mercantile Exchange in trading volumes, taking over the third position of the world most popular benchmark. In the end of September, the contracts traded on INE occupied a 6% share of the global market according to Reuters (See Figure 1). From the perspective of market participation, INE crude oil futures accounts exceeded 30,000 by September 2018, of which 15% are mainly securities companies, fund management companies, trust companies and other financial institutions, indicating the strong demand of asset management companies for crude oil futures in China. And the proportion of international investors has increased to about 15% in September from 5% in July. Oversea investors mainly come from Hong Kong, Singapore, the United States and the United Kingdom.

**Figure 1: Crude oil futures volume share, 2018<sup>9</sup>**



(Source) Reuters<sup>10</sup>

## (2) The vulnerability of INE futures and the pricing problem

The vulnerable price pattern occurred, which might be related to the composition of the INE market. From September to December 2018, some violent fluctuations emerged regarding its trading volume and price after the favorable outlook during the previous six months (See Figure 2), which might be an early warning for the potential systemic risk. When looking into the make-up of the participants behind the prosperous INE market, it is found that the future volume<sup>11</sup> is significantly higher than open interest<sup>12</sup> compared with other futures products (See Figure 3). The ratio of open interest to volume in futures contracts is an important reference to

<sup>9</sup> Million contract unit per year with 1,000 barrels per unit.

<sup>10</sup> Reuters:

<https://www.reuters.com/article/us-crude-oil-futures-china-analysis/chinas-flawed-futures-contract-pushes-oil-trade-to-record-high-in-2018-idUSKBN1OB0K7>

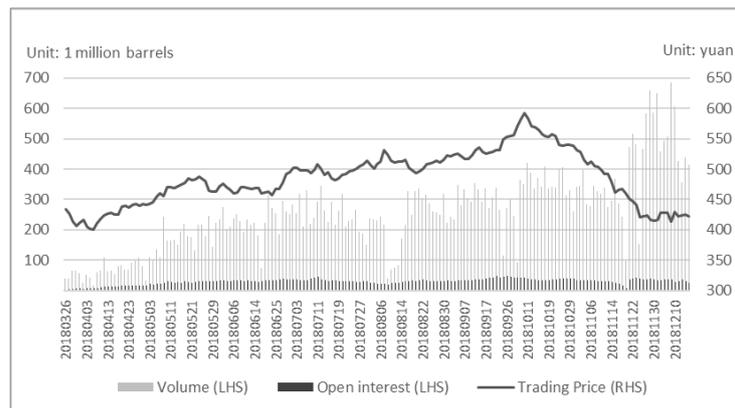
<sup>11</sup> Volume refers to the quantity of contracts traded in a given period.

<sup>12</sup> Open interest denotes the number of active contracts.

measure the tendency for short-term investment activity. The ratio captures speculative market activity under the assumption that the majority of speculators prefer to get in and out of the market in a short period of time, in contrast to futures traders who are not engaging in speculation. Hence a speculator taking opposite positions (buying and selling contracts) in the market within days or weeks will generate an increase in monthly registered volumes but little change in monthly open interest. So, changes in this ratio would potentially capture changes in speculative activity<sup>13</sup> and reflect whether or not a trading market is healthy and stable<sup>14</sup>. Therefore, there is possibility that currently in INE futures market, the proportion of speculators, who mainly conduct short-term trading and try to make a profit from price fluctuation, are greater than that of hedgers, who trade with the attempt to reduce risk or volatility. Although speculators may increase the amount of information in the market, a large proportion of speculators may sometimes drive short-term prices fluctuation easily, or occasionally send the price of an asset too high or too low. Because they are willing to take on greater risk than typical buy-and-hold investors and interested in emotions and anxieties that drive the market rather than the actual value of an asset.

It still requires a long process for international participants to hedge with INE crude oil futures. As INE was just listed within a year, investors are still using WTI and Brent as the basis for futures hedging. In the future, more and more companies might choose INE hedging as INE spot market usage increases. For example, the transaction between Shell group and Sinopec United Petrochemical Company was priced in INE.

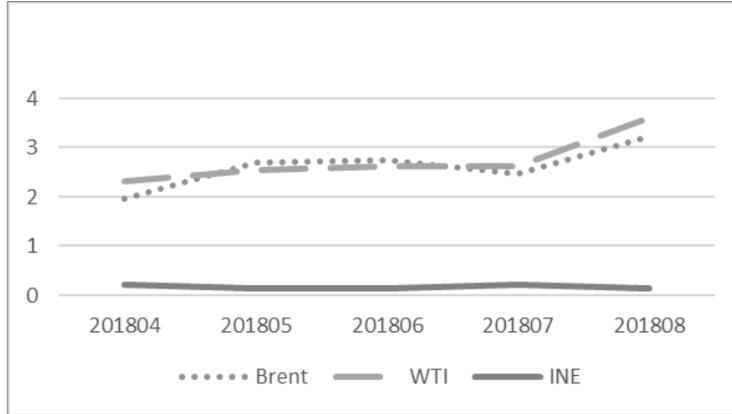
**Figure 2: Shanghai Crude Oil Futures Performance, 2018**



(Source) INE

<sup>13</sup> Robles M, Torero M, Von Braun J. When speculation matters[R]. 2009. <https://ageconsearch.umn.edu/record/49999/files/ib57.pdf>

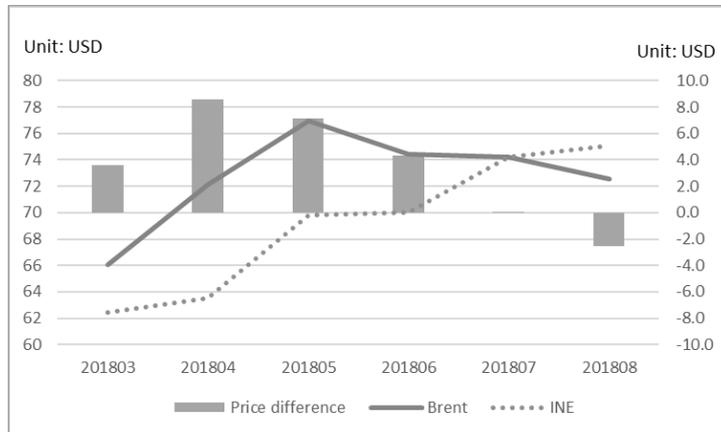
**Figure 3: Ratio of Open Interest to Volume, 2018**



(Source) ICE and INE

Considering the price discovery process (Or price discovery mechanism)<sup>15</sup> of INE futures, its price is weakly related to the crude oil market fundamentals of China. Since the launch of INE crude oil futures, its price pattern has been correlated with Brent and WTI crude oil futures, the gap of which has not exceeded  $\pm 10$  U.S. dollars (See Figure 4 and Figure 5).

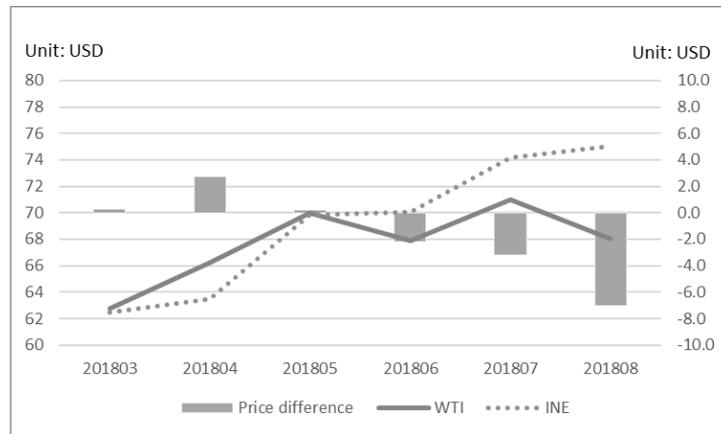
**Figure 4: Price Difference between Brent and INE, 2018**



(Source) ICE and INE

<sup>15</sup> The process of determining price of asset in the marketplace through interactions of buyers and sellers

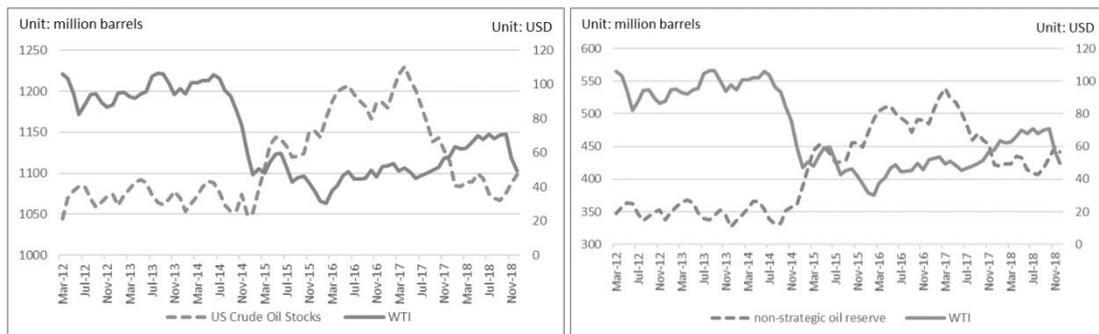
**Figure 5: Price Difference between WTI and INE, 2018**



(Source) ICE and INE

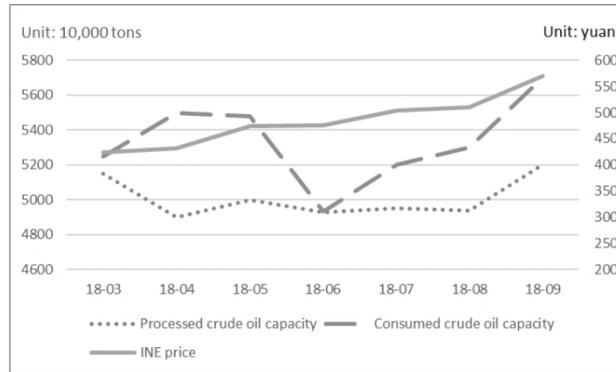
INE futures product is not fully reflecting the crude oil supply and demand of a country/region. In mature markets, such as NYMEX for WTI trading, futures prices have strong guidance on spot prices, or have strong price discovery functions. From 2017 to September 2018, U.S. commercial crude oil inventories and WTI settlement prices showed a significant negative correlation, which means there is a high degree of conformity between WTI and U.S. commercial crude oil inventories (See Figure 6). When looking into the INE crude oil price (See Figure 7), currently, there is no obvious negative correlation between the price and crude oil processed, nor crude oil consumed. It is still unable to conform to the fundamental situation of China's crude oil market.

**Figure 6: Correlation between WTI and U.S Crude Oil Stocks**



(Source) EIA

**Figure 7: Correlation between INE and China Commercial Crude Oil, 2018**



(Source) EIA and INE

### 5. Contradiction between INE crude oil futures and Chinese financial reform

Except for the speculative short-term trading feature of INE crude oil trader mentioned before, the core barrier for INE to become an international pricing center lies in several contradictions during the financial reform process of China.

#### (1) INE and the monopoly of China’s oil market

From the successful cases of the commodity futures market of the United States, carrying out futures trading requires a high degree of marketization and the active participation of companies in upstream and downstream. But this problem is complicated in China.

China’s oil market is dominated by three biggest national oil companies mentioned before. The three have formed a mature and complete industrial chain from exploitation and refining in upstream, to sales in downstream. As for the oil pricing system at present, the price of crude oil in upstream is fixed by the oil enterprises referring to the corresponding foreign oil, while the price of refined oil in downstream is adjusted by the NDRC referring to the average prices of Brent, Dubai and Cinta<sup>16</sup> in 10 working days.

Hence, it is reasonable to take INE crude oil futures prices into consideration in the future to not only shorten the pricing cycle, but also to reflect the real supply and demand situation of the China market. But here comes an obvious paradox. The three national oil companies, which are the largest crude oil producer, importer, smelter and distributor of the country, are so strong as to decide the price within the group. No participation of them in the crude oil futures market might directly bring about the failure to the market, but full participation might result in prices manipulation, because no one wants to compete with them. Also, the possibility that the three companies may intervene the market “unintentionally” still exists.

To ease this contradiction and foster INE futures, China has made attempt. In 2015, it approved the crude oil import licenses to private refineries. Therefore, private refineries

<sup>16</sup> Indonesian crude oil

developed rapidly and actively contributed to the international marginal oil demand. As the crude oil market is getting more and more liberalized, INE price would gradually functions as an authoritative futures price, and then further promote the reforming process of China's oil industry to be market-oriented.

## **(2) Dilemma of calling for participation of international investors**

As INE is designed to be an international platform which enables foreign economic institutions to participate in the transaction, foreign capital should be allowed to transfer money into the platform and withdraw earnings using foreign currencies or even in RMB. In turn, China's financial institutions are supposed to share the benefits brought by external capital and learn the ability to survive from external risks. Fact is that although the INE crude oil became an immediate hit in the market, China's crude oil futures remain far behind the mature contracts in Europe and the U.S. in pricing power due to the dominant influence of Chinese traders.

The regulators have recognized that the process of liberalizing capital flows is risky based on the historical experience. Freer capital flows can be accompanied by sudden reversals on economic growth and inflation, due to the huge movements in the exchange rate and financial instability.

The trade-off between freer capital flows and stability in RMB has also become a major policy issue. Faced with such dilemma, Chinese policymakers favor sequencing capital account liberalization to withstand the adjustment of free capital flows. In particular, inflows are liberalized more than outflows especially after 2016. It can be proved by the fact that official and institutional investors have been granted greater freedom to undertake capital account transactions, compared with non-state-owned corporations and private financial institutions.

The participation of international investors will inevitably impair the controlled management method by Chinese government. At present, INE still implements the quota management for foreign investment, so the accuracy and credibility of INE pricing is also affected

## **(3) Capital liberalization in a Chinese method**

According to the Mundell-Krugman's impossible triangle theory originated in the 1960s-1970s, it is impossible to achieve all three of the following desirable objectives of international monetary arrangements: a fixed foreign exchange rate, free capital movement without capital controls, an independent monetary policy. In other words, a central bank can only pursue two aims out of the three mentioned above simultaneously. For example, if a country liberalizes international transactions under a pegged rate system, capital will move from a low-interest rate country to a high-interest country. This would make it very difficult to maintain an independent monetary policy.

For China's case, Mr. Zhou Xiaochuan, the former head of the People's Bank of China, pointed out that with the countries' expansion, the policy definition of the three items of the

triangle has been blurred. Chinese Economy is facing dynamic evolution. Therefore, from a transitional economic point of view under that situation, People's Bank of China has the capabilities to discover some standpoints in the dynamic triangle and keep the three aims moving in the same direction stably and steadily.

Capital account liberalization in China has been carefully sequenced, gradual and heavily managed by the authorities. In particular, the pace of reforms has not been steady; sometimes the pace has slowed, such as in the late 1990s Asian financial crisis or the 2008 global financial crisis when capital outflow and financial stability concerns were heightened.

The action of promoting INE crude oil futures reflects that China is facing the reform directly and getting ready for an economic reform now. The circuitous style of solving problem favored by Chinese government may not work well and even create new ones regarding this issue.

## **6. Conclusion**

As is seen above, INE crude oil futures are initially designed as a crucial tool for China to take a leading role in benchmarking crude oil in the world market as well as to achieve its financial reform in the long run. However, behind its satisfying performance during the first six months, some problems and worries emerged.

One of the biggest problems is the vulnerability of INE futures and its failure in reflecting the real condition of the market, which are caused by the unreasonable participant composition and the overdependence on international prices. With the expectation to be an international platform for global participants, however, INE turns out to be mainly a Chinese market for Chinese traders who even don't trade based on market fundamentals. As a result, the inconsistent trading volume is less helpful for international traders to refer to as a financial hedge, and therefore hinders the INE's further development and financial reform strategy of China.

There are four features of the approach of China's financial reform: the stability of the macroeconomic financial market matters the most; alert to the capital flight; extreme cautious about the liberalization of the foreign exchange system; and the financial reform regarding marketization has slowed.

Considering the special situation of Chinese crude oil market, how to promote the proper participation of monopoly oil companies in the INE crude oil futures market; how to encourage domestic market to refer to INE crude oil futures as the benchmark; and how to reduce the interference of national price control, all the above are challengeable. It might be good for China to start by limiting the state's role in allocating capital and let the markets operate freely, so that asset price can reflect the reality.

In addition, an exchange rate pricing mechanism that can meet the requirement of an international futures market is demanded. Regarding the China's circuitous style of solving the

problem, how to improve the current exchange rate pricing mechanism should be added more priority than capital account liberalization. For China, exchange rate reform is a prerequisite for seizing international crude oil pricing power. Under the current foreign exchange management mechanism, the introduction of crude oil futures with international traders and capitals flowing in will bring pressure and risk to foreign exchange management, which is also not conducive to the establishment of internationally recognized crude oil futures prices.

What should also be taken into consideration is how to change people's concept towards the Chinese crude oil futures. For a long time, crude oil enterprises are accustomed to producing according to instructions, without caring about the profits and losses, therefore naturally resist participating in liberalized futures market.

For the future of Shanghai INE crude oil futures market, it is hard to predict how it will be like in 5 or 10 years, because it largely depends on how soon the markets and entrepreneurs can freely play a bigger role. The opportunity for INE is the nation government's goal of positioning Shanghai as an international financial center with stronger financial resource allocation capability by 2020<sup>17</sup>. So, as a part of that blueprint, it does not seem a distant prospect for Shanghai crude oil futures to be further enhanced, the transaction scale of overseas investment will likely be expanded significantly.

Regardless of the speed of reform, China has been working in the direction. In this regard, the launch of Shanghai INE crude oil futures is a significant step forward. In addition, because of its high volatility and correlation with international crude oil futures, INE crude oil futures still have the potential to become a good investment product. It is greatly hoped that this kind of efforts will be steadily promoted in the time to come.

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<sup>17</sup> The People's Bank of China, the National Development and Reform Commission, the Ministry of Science and Technology issued the Action Plan for the Construction of Shanghai International Financial Center (2018-2020) on January 29<sup>th</sup>, 2019.

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## Appendix

Item	Explanation
Product	Medium Sour Crude Oil
Contract Size	1000 barrels per lot
Price Quotation	(RMB) Yuan per barrel (no tax or duty included in the quotation)
Minimum Price Fluctuation	Monthly contracts of recent twelve (12) consecutive months followed by eight (8) quarterly contracts.
Trading Hours	The last trading day of the month prior to the delivery month; The Shanghai International Energy Exchange is entitled to adjust the last trading day in accordance with the national holidays.
Delivery Period	Five (5) consecutive trading days after the last trading day.
Grades and Quality Specifications	Medium sour crude oil with the quality specifications of API 32.0 degrees and sulfur content 1.5% by weight The deliverable grades and the price differentials will be stipulated separately by the Shanghai International Energy Exchange.
Delivery Venues	Delivery Storage Facilities designated by the Shanghai International Energy Exchange
Minimum Trading Margin	5% of contract value
Settlement Type	Physical delivery
Product Symbol	SC
Listing Exchange	Shanghai International Energy Exchange

(Source) INE

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