The Likely Impact of the First Excellent Futures Contract for Internationally Traded Crude Oil

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Traders, economists, and commodity exchange executives have struggled for more than a century to create a high-quality energy futures contract. In the process, they have encountered, for several reasons, far more significant problems with crude oil, natural gas, and electricity contracts than for other commodity futures. Take crude oil, for example. The absence of a top-quality futures contract for delivering crude in international markets has denied consumers the economic benefits that come with perfect contracts, e.g., crude oil markets have remained uncompetitive, and producers have enjoyed higher prices than would otherwise prevail.

The ICE Murban futures contract (labeled the ICE Futures Abu Dhabi, or IFAD, contract) will probably resolve this issue. The IFAD contract will provide buyers of internationally traded crude—particularly those who rely on Middle Eastern crude—with an instrument that reduces their financial risks dramatically. It will also make the global oil market more competitive and reduce the more prominent producers' market power. Ultimately, oil may become "just another commodity" like cotton or wheat.

The transition to a more competitive market could be accelerated if efforts to restrain fossil fuel emissions decrease oil use over the next ten years. If this occurs, the new contract's backers could realize immense gains relative to higher-cost producers like those in the North Sea, Brazil, Russia, Kazakhstan, the United States, and Canada.

The IFAD contract's introduction and other steps taken by the United Arab Emirates, particularly the Emirate of Abu Dhabi, are a huge deal. Quite simply, the contract can be likened to an insurance policy to assure the UAE's economic survival as a major oil-exporting country, possibly making it the sole survivor in the Middle East.

This paper returns to the origin of the PKVerleger LLC publications and the company's founder by reviewing the basis of futures contracts, their historical success, and the IFAD contract's potential impacts. I present my analysis in four parts.

Part I examines the futures markets' history. I cite works by Williams (1986, 2001), Hieronymus (1971), and others. These analyses lay out the conditions for successful contracts, that is, a contract that allows market participants to shift price risk to others willing to accept it. They also identify the effect of successful contracts, which is the creation of highly competitive commodity markets. I note, too, that competitive commodity markets can, at times, be exceedingly profitable for low-cost producers.

Part II briefly discusses the linkage between storage, futures, and forward markets. Historically, the success of futures markets has been linked to the availability of storage capacity. Markets that lack storage capacity can work but not as successfully as markets integrated with storage.

Electricity futures markets and the Brent crude market suffer from this absence of integrated storage.

Part III reviews the history of oil futures and commodity markets. The first markets created were for heating oil and gasoline in the United States. Then came markets for gasoil in Europe and crude oil and natural gas in the United States. These markets had the expected impact. Competition increased, profits fell, and the firms seeing high returns (such as the integrated oil companies) exited because returns were depressed by increased market transparency.

Part IV focuses on the failure of current international crude futures contacts. Despite the Intercontinental Exchange's extensive efforts, the Brent futures contract has suffered because it has not met the critical conditions for success. The lack of a deliverable crude that can be stored at the delivery location is partly responsible. Another more significant problem, though, is the heterogeneity of North Sea crude. S&P Global Platts' expansion of its Dated Brent assessment to include WTI produced in Midland for delivery in Europe highlights the lack of a real, trustworthy, non-manipulable indicator of the North Sea crude's market value.

Part V concludes by explaining how the Murban contract could become the true price measure of international crude. Other candidates that might have taken the role are Saudi Arabia's Arab Light or Iran's Iranian Light. However, Murban is the first of these crudes to meet all the requirements for a successful futures contract. Absent government interference, the UAE's Murban will be the crude the world uses to set prices.

I. Understanding the Role of Futures Markets

Although apparently never written about in the economic literature, successful commodity markets, especially futures markets, destroy economic competition, monopolies, and cartels. The evidence for these impacts is clear, as the papers published over the past century attest even though they tend to dance around the subject.

The strongest confirmation comes from Baer and Saxon (1929). These authors address the successes and failures of producers and producer organizations to lift raw materials prices, highlighting the leverage producers attempt to gain over the economically concentrated industries that buy their commodities.[1]

Hieronymus (1971) refines the Baer and Saxon discussion by emphasizing how having exclusive access to market information creates an unfair advantage:

> **He who would control must first conceal** [emphasis added]. If a merchant possesses information that is not available to the people from whom he buys or two whom he sells he is in a position to reap monopolistic profits. In the cash commodity trades, some firms are very much larger than others and the larger ones can afford the expense of collecting market information while the small ones cannot. The most outstanding example is the position of farmers vis-à-vie terminal grain merchants, meat packers, citrus fruit

[1] Baer and Saxon (1929), pp. 20-24.

> processors, potato merchants, etc. Without comprehensive information they are not in a position to form intelligent ideas about real market value and can be taken advantage of.[2]

Liquid commodity markets break down these information barriers.[3] The price information levels the playing field and reduces the economic advantage of large firms.

Futures markets, though, are complex institutions. Baer and Saxon and others have laid down the basic conditions for markets to work. Verleger (1987) explains:

> First, the commodity must be homogeneous. One "lot" (or barrel) needs to be identical to the next.
>
> Second, the commodity must be standardizable.
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> Third, the supply and demand for the commodity must be large. Hieronymus notes that small markets often fail because speculators can control supply or demand and manipulate prices.[4]
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> Fourth, the commodity must flow freely to the market unencumbered by governments or private organizations' artificial restraints.
>
> Fifth, supply and demand must be uncertain.
>
> Sixth, the commodity must be storable so that forward and futures contracting can operate.

Futures markets ideally also depend on the price of a commodity's futures contract "converging" to the price of an equivalent item in the cash market with the contract's expiration. The contract specifications are generally written to match the specifications of a commodity regularly traded in the physical market. This allows the seller to provide the buyer with a good that meets the commercial standards if the traders choose to go to delivery.

When these conditions obtain, large and small entities can compete successfully in supplying or purchasing a commodity. Smaller farmers, for instance, can survive in a world dominated by large agribusiness firms if they can achieve the same economies of scale. Smaller, independent oil producers can also compete with larger multinational corporations or state-owned oil companies, assuming they, too, can control their costs.

Futures markets, then, level the economic playing field in industries where the bigger firms do not enjoy substantial economies of scale. Put another way, futures markets permit small operators to compete with larger operators in many businesses.

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[2] Hieronymus (1971), p. 101.
[3] Carlson (1984) or Williams (1986).
[4] Hieronymus (1971), p. 20.

Futures markets, however, are not a panacea for the absence of competition in many parts of the global economy. They work when items are homogenous and interchangeable—corn, soybeans, or gasoline, for example. They might work if items are almost homogenous, say, a single automobile model, although each unit of that model will likely differ slightly. Futures markets probably would not allow smaller firms to compete, though, with Amazon, Facebook, or Google, which provide services, not commodities, or even Apple because the iPhone, although a commodity as a physical item, is linked to a vast and complicated infrastructure.

Futures markets also do not entirely overcome the economies of scale that enable large firms to outperform smaller firms financially. Big trading companies with access to low-cost capital have thrived for over a century as they made maximum use of futures and commodity markets. Cargill has been extraordinarily successful, as Brohl's (1992) three-volume history of the firm demonstrates. Cargill's skill at developing and using proprietary information to profit was evident in its ability to buy large amounts of grain in 1973 without moving prices when the United States sold wheat to Russia following a crop failure in Ukraine. Cargill had completed its purchases before the transaction became news. Prices rose after details of the sale were made public, creating anger in the United States (see Morgan, 1979).

In oil, two trading firms, Vitol and Trafigura, have used their specialized knowledge of market conditions to ensnare large profits from buying and selling crude and products. Their unique information, combined with their access to capital, gives them an advantage even in competitive markets.

II. The Importance of Storage

Historically, the ability to store a commodity associated with a regulated futures market was a requirement for a contract's approval. The situation has changed. Many contracts today gain approval even though storage is impossible. Electricity futures contracts offer a prime example. Open interest in most contracts for electric power delivery is much smaller than for storable energy commodities such as crude oil, petroleum products, or natural gas.

Farmers have stored commodities at grain elevators and sold futures directly or through the elevator operator. Elevator operators or traders would often buy and hold crops in elevators after harvest, waiting for seasonal increases in prices or export opportunities.

Wright and Williams (1982) identify a key reason for the importance of storage in commodity markets. As they explain, futures markets enable a trader to transfer supplies from the present to the future. This ability to store with minimal financial risk through hedging makes the markets more attractive.

As discussed in more detail below, the WTI futures contract has been far more useful than the Brent contract, despite the North Sea oil market having far greater in importance than the US midcontinent market, precisely because Cushing has storage and the North Sea delivery points do not. Thus, the combined open interest in the ICE and CME WTI contracts has almost always exceeded the open interest in Brent. One can assert that the WTI contract is "complete," while

the Brent contract is "incomplete" because Brent buyers and sellers do not have the option of storing at the loading point.

III. Energy Commodity Markets

The movement of oil volumes worldwide was once controlled primarily by seven companies, a.k.a. "the Seven Sisters."[5] These companies could "shuffle oil around the system" before 1973, according to Silvan Robinson, for years Royal Dutch Shell's head of oil trading.[6]

Robinson explains that during the 1973 crisis, England's prime minister, Edward Heath, negotiated for extra oil supplies for the United Kingdom during the Arab embargo. The oil was then handed over to Shell and BP "who promptly fed the oil into their general supply systems to make up, *inter alia*, for the boycott of Holland."

Robinson adds that the majors no longer enjoy such unique advantages. For instance, they can no longer administratively reallocate oil. "The only way of securing oil is price." By 1985, spot transactions replaced long-term contracts or became the determinant of crude prices in the contracts remaining.

However, the transition to an energy futures market began ten years earlier in the US Northeast and Europe. In the Northeast, US term supplies to a group of independent product marketers selling heating oil and gasoline were terminated following the US government's deregulation of petroleum product markets. Goodman (2011) explains that the independent marketers were left to accept the large multinationals' term prices.

The system was broken by the renegades at the New York Mercantile Exchange (NYMEX). The NYMEX was slated by the US Commodity Futures Trading Commission for extinction in the late 1970s following the disastrous failure of its potato futures contract. It was prohibited from inaugurating new contracts. However, the CFTC had previously approved a contract for heating oil trading. It was revived in 1978. Within two years, it was flourishing, as Goodman observes, because buyers and sellers could see actual transaction prices in real-time. Goodman also notes that Michael Marks, the NYMEX chairman, was once verbally attacked by a broker who complained, "Everyone can see what is happening!" She adds,

> The game was up. The oil companies could no longer bamboozle anyone into paying more than fair value for oil or fuel. "Even though we didn't start out as the most important player or the biggest, the accessibility of our prices made us the nation's main reference point," Marks says.[7]

The statement is an exaggeration. Platts did publish cash prices for distillate fuel oil and other products in its ubiquitous *Oil Price Report*. But a search through the issue that dates to the first

[5] Adelman (1972) lists eight in his treatise: Texaco, Standard Oil of California, British Petroleum, Compagnie Francaise des Petroles (CFP, now Total SE), Standard of New Jersey, Mobil, Shell, and Gulf.
[6] Robinson (1998), p. 30.
[7] Goodman (2011), pp. 71-75.

reported NYMEX trade—November 14, 1978—shows only fifty-five cash series for delivery in Rotterdam, Italy, Singapore, the Middle East, New York, the Gulf Coast, and the Caribbean.

Today the publication is thirty-five pages long. One finds in the report over two hundred fifty cash price assessments for products delivered in Rotterdam, Italy, Singapore, New York, the Gulf Coast, and the Caribbean as before, as well as Fujairah, South China, West Africa, Chicago, Los Angeles, San Francisco, and five countries in Latin America. One can also find price quotes for spot and forward cargos or pipeline lots for perhaps four hundred crude oil streams.

The NYMEX changed the market.

Goodman, though, ignores a major event that contributed to the NYMEX's success: a change in government policy. By luck, the NYMEX members benefited from major oil companies exiting the heating oil supply and distribution business. Previously, allocation regulations introduced by President Nixon in 1973 had locked companies such as Shell, Texaco, Chevron, and Gulf into contracts with local distributors. From 1973 to 1980, these firms had to supply heating oil. In 1979, they were also ordered by the Secretary of Energy to accumulate excessive distillate inventories in the fall. It was a purely political ploy to prevent high prices or shortages in the winter of 1980 just as the Democrats' Jimmy Carter campaigned for president in New Hampshire against Senator Edward Kennedy.

Also, under their pre-1973 contracts, the large companies were required to finance the inventories accumulated by distributors during the summer. These agreements were based on the historical practice of "summer fill." With summer fill, a major company such as Exxon would deliver large heating oil volumes to the distributor terminals. Exxon would then be paid when the distributors brought the oil to consumers six, seven, eight, or even nine months later.

The summer-fill system worked when integrated companies owned much of the crude they produced. Exxon, for example, might extract crude oil in Saudi Arabia in May, move the crude to its refineries by June, process it into heating oil in late June, and deliver the oil to a dealer in Boston in August. Exxon would receive payment for the oil in February of the following year. As noted, this process worked satisfactorily if the crude oil produced in Saudi Arabia belonged to Exxon, in which case the payment of $6 per barrel for heating oil that cost $0.25 to produce, transport, and refine offered a substantial reward.

The situation became unsatisfactory when Exxon had to pay $20 per barrel for the crude produced in May 1979, absorb transportation and processing costs of $1 to $2 per barrel, and then wait until February 1980 to be paid perhaps $23 per barrel for the product. The interest rate increase to more than fifteen percent tied to Federal Reserve chairman Paul Volcker's efforts to curb inflation made the transaction's economics even less favorable.

For this reason, the larger oil companies pulled out of the heating oil business as soon as allowed. Their exit was no different than their departure from exploration and production in the United States. Heating oil markets were partially deregulated in 1979 and fully deregulated in 1980.

The absence of the large oil companies created a significant problem for distillate fuel oil suppliers. These firms needed to build summer inventories to assure adequate stocks during peak winter weather. They lacked the capital to acquire needed heating oil with crude oil prices above $40 per barrel. They also could not obtain financing from banks because the institutions feared, correctly, that heating oil dealers would not perform on loans if heating oil prices dropped substantially, as they might during a warm winter.

The futures market provided the solution, mainly because sizeable commercial storage facilities were available. Major New York and French banks such as BNP Paribas stepped in to offer financing to heating oil distributors. These loans were conditioned on the distributors selling heating oil futures to hedge inventories. This practice, while new to oil, was conventional. Distributors would borrow from a bank, say, Chase, buy the oil from a supplier such as Exxon, put the delivered oil in storage, and sell futures on the NYMEX for delivery in January or February. Such transactions provided the financial insurance required for these businesses to function.

The heating oil contract succeeded in keeping heating oil firms solvent and their customers supplied. Regulations made trading superfluous initially. In 1979, only thirty-three thousand contracts changed hands. (Each contract covers one thousand barrels of heating oil.) By 1986, however, trade had increased one hundredfold as 3.2 million contracts changed hands. Open interest (the number of barrels covered by trading) rose from two million contracts at the end of 1979 to eighty million contracts by the end of 1986. In effect, then, New England heating oil users, who once relied on the majors to guarantee their winter heating fuel needs were met, had a new guarantor: Wall Street.

Heating oil, though, was one of the few freely traded energy commodities. Missing from the November 14, 1978 issue of the *Oil Price Report* was a cash price for crude. No one published cash crude prices in 1978 because a cash market did not exist. In the Midwest, buyers such as Koch posted whatever price they were willing to pay. The "posted price system was it." There was no open buying or selling—and thus no transparency.

The system changed in 1983 when the NYMEX introduced a crude futures contract. The market structure was slow to change, though, until the British government intervened, breaking the entire established pricing scheme when it enacted the Petroleum Revenue Tax or PRT.

The PRT imposed a seventy-five-percent tax on incremental revenues from selling crude oil after cost deductions. The tax was applied to cash oil sales if production was sold to a third-party buyer or on a "deemed price" determined arbitrarily by UK tax authorities if a producer kept its oil in its integrated system. Uncertainty regarding what the deemed price might be prompted all producers, mostly major oil companies, to sell their oil for cash. Thus, a transparent crude market was created by the firms that had previously fought to prevent it.[8]

The creation of the Brent cash market followed by a forward market and the reporting of cash trade in "Dated Brent" provided an opportunity to design a futures contract. The International Petroleum Exchange (IPE) did so. After several adjustments, the contract flourished, and today it

[8] Horsnell and Mabro (1993), pp. 61-69.

is the largest single crude oil futures contract, although open interest in the two WTI contracts often exceeds open interest in the single Brent contact.

However, the Brent market and the contract suffer from the lack of commercial storage facilities at the delivery location. This handicap has made the US WTI futures contract more important when combined open interest is considered despite the limited volumes of WTI available.

IV. International Crude Futures Contracts

The Brent futures contract has been extraordinarily successful as a benchmark. However, over time, the Brent field's output has declined to the point where today it has almost vanished. Production peaked in 1984 at over four hundred thousand barrels per day, a volume that allowed eight to ten tankers per day to be loaded. The volume has decreased to low levels today. Argus Media reported that Brent loadings in July 2020 were ninety-seven thousand barrels per day.[9] The decommissioning of some North Sea platforms has begun.[10]

The Dated Brent price, though, continues to be published. To compensate for the drop in Brent production, S&P Global Platts has added other crudes to the mix from time to time. Longley (2021) notes that "Platts widened what constituted 'Brent' to include four other grades—Forties, Oseberg, Ekofisk, and Troll—but even those are slowly running out." A chart included in his article indicates loadings of the four crudes are now around eight hundred thousand barrels per day.

This inclusion of other crudes has maintained the *perception* of a physical basis for the futures contract. However, the Brent contract still suffers because the underlying physical commodity is a heterogeneous amalgam of various crudes. Furthermore, Platts continually changes Dated Brent's makeup. Thus, a firm buying six-month-forward Brent futures to hedge has little idea of the precise quality of the oil hedged.

Carolan (2021) describes the problems S&P Global Platts encountered in revising its data collection procedure to produce the value it reports for Dated Brent. Platts had planned to change how Dated Brent was calculated. The changes were to include WTI produced in Midland, Texas. The proposal was opposed by many in the industry who rely on the published assessment in conducting their business. Carolan adds,

> Platts in the past has been able to forge ahead with changes to Dated Brent—such as adding Troll and introducing quality adjustments—with the support of a few major North Sea participants. The rest of the market eventually accepted the changes. But the experience of the past few weeks suggests those days may be over. Platts, by its own admission, has lost the trust of the industry and any changes to Dated Brent now will require a form of wider consensus.
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> But as the past few weeks have shown, no consensus exists on the future of Dated Brent—or even its purpose. Questions remain over whether it should reflect the price of

[9] "North Sea Benchmark crude loadings to slow," Argus Media, May 28, 2020 [https://tinyurl.com/ybs5uy69].
[10] Martén and Borja (2016).

> North Sea crude or European refining economics. With anti-trust concerns making a coming together of the industry almost impossible, it is unclear where a consensus will come from.
>
> And declining North Sea production means that the clock is ticking. Platts expects the amount of crude underpinning the benchmark to drop below a cargo a day next year—a threshold the firm has described as "critical."

The WTI contract is different. Initially, several crudes, including Brent, could be delivered to fulfill the WTI contract, and even today, traders blend various crude streams to meet the WTI specifications. The specifications, though, have remained constant, unlike those for Dated Brent. Moreover, the fracking boom has increased the actual WTI supply.

The WTI contract also exhibits the aspects of a successful futures contract. There are lots of lots. The lots are interchangeable. The oil can be stored at the delivery site (Cushing has grown substantially as a storage location). And finally, the oil flows to the market from producer lots to buyer lots.

WTI has one disadvantage. It is not an international crude. That drawback has lessened with the construction of pipelines and export terminals. However, the fact that it is "terminals" rather than "terminal" highlights a major problem. The US Gulf Coast has several export terminals. This makes WTI less desirable than Murban, the new, ideal export crude, because there is no single storage or loading point. Another problem is that the terminals' smaller size often prevents them from accommodating the VLCCs favored in the industry.

V. Murban: The Ideal Commodity Crude

ADNOC, the UAE, and the ICE Futures Abu Dhabi have created, for all practical purposes, the best structure for a crude oil futures contract. Absent unforeseen problems, the IFAD contract should quickly become the world marker.

Murban's first advantage is volume. While various estimates exist, it appears that more than two million barrels per day can be supplied and that the supply could be as high as four million barrels per day. Also, the crude's reserves are ample. Unlike Brent, Murban will be a real crude oil rather than a historical anecdote that no longer flows in significant volumes.[11]

Murban's second advantage is storage. ADNOC has spent more than a billion dollars expanding tankage in Fujairah. The capacity may exceed thirty million barrels. The storage is adjacent to loading jetties. This should meet the storage criteria, especially if buyers can contract to store on occasion.

There are also several producers. In addition to the state-owned firms, private companies such as Crescent Petroleum and Petrofac International also operate in the UAE.

[11] One might think of the reliance on Brent as being equivalent to an auto industry publication using the price of Model T Fords in 2021 to measure auto prices.

The Murban price is also volatile, as are the prices of other oils, and the demand is uncertain. On the other hand, Murban is a crude sought by buyers in Asia, the source of the largest expected consumption increase.

Murban will likely become the world's most important crude because the UAE has lifted the destination clause from contracts. The crude will be freely traded, with buyers being able to move the oil to any destination. In contrast, contracts offered by other Middle Eastern producers stipulate that their oil must be moved to specific refineries. The buyers also must nominate in advance the amounts of oil they seek. These volume nominations are sometimes accepted and sometimes rejected.

Finally, Murban is the ideal crude for the growing Asian market. Most forecasts see consumption increasing in Asia while declining in the rest of the world. Asian buyers depend heavily on Middle East crude, not Brent. Also, Murban is much like Arab Light, the crude in widest use in Asia. Murban is especially ideal for India because buyers can lock in prices and thwart the efforts of their economic enemy, Saudi Arabia, to push crude oil prices higher.

Buyers of Murban will face none of the traditional Middle Eastern contractual limitations. A Chinese refiner needing a cargo of crude will be able to buy it by bidding for the futures contracts and then taking delivery. The buyer will not face the risk of an energy minister or politician deciding to cancel the contract.

For these reasons, one should expect the attention of global oil traders and speculators to turn rapidly to the Murban contract as a substitute for Brent and possibly WTI. Murban will also become the major price indicator for Middle Eastern oil.

In the simplest terms, any attempts by groups such as OPEC to control oil will be moderated.

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