INSIGHTS INTO PRICE FORMATION IN OIL MARKETS

AN INTERNATIONAL ENERGY FORUM PUBLICATION 28 November 2013

IEF DIALOGUE INSIGHTS

VIENNA, AUSTRIA | 28 NOVEMBER 2013

MAIN DISCUSSION TOPICS AND FINDINGS

TABLE OF CONTENTS

1. KEY INSIGHTS 2

2. BACKGROUND 4

3. THE OIL PRICE FORMATION PROCESS: CAN OIL PRICES BE WRONG? 4

4. PRICE FORMATION, PRICE REPORTING AND PRICE REPORTING AGENCIES 5

5. PRAs IN THE REGULATORY SPOTLIGHT 6

6. "PAPER BARRELS" AND SPECULATION 7

7. REVISITING 2008: POLICY, DISRUPTIONS AND FINANCIAL MARKETS 8

8. GUIDANCE FOR POLICYMAKERS 9

9. ADDITIONAL THOUGHTS 10

10. ANNEX I: BACKGROUND INFORMATION ON PRAs 12

1. KEY INSIGHTS

- One way to think about the fair or "correct" price of crude oil is to define it as the price at which both buyers and sellers in a free and competitive market agree to close a transaction. Following this line of thinking, the value of crude is never "wrong" or mispriced, and current criticisms of the process of oil price formation are unwarranted.

- A simplistic view of the world wherein the crude price is never wrong does not take into account, however, informational asymmetries between buyers and sellers, herd behaviour, effects on third parties, market bubbles, monopolistic or oligopolistic practices, and other market externalities with the potential to cause a divergence between the observed oil price and the one that reflects oil's scarcity value. From this perspective, prices can send the wrong signal unless appropriate measures are implemented.

- *Price formation* takes place through the interaction of numerous buyers and sellers in the oil market. *Price reporting* is performed by companies known as Price Reporting Agencies (PRAs), which observe quoted prices from negotiations and prices referenced in closed deals.

- While some characterise PRAs as passive observers of the price formation process, PRAs cannot be considered absent from that process, as the price at which a buyer and seller close a deal today may well be influenced to some extent by the price that a PRA reported yesterday. Price reporting is thus an input into the price formation process for crude.

- New regulations to change the current practices of PRA should be analysed carefully before implementing them. If not properly crafted, efforts to regulate PRAs might engender greater transparency surrounding PRA practices at the cost of less transparency regarding oil prices, as the PRAs may receive fewer inputs and data points with which to work.

- While there is apparent consensus among policymakers that markets should indeed be as transparent as possible, policymakers should bear in mind that the availability of more information cannot in and of itself eliminate buyer's regret or seller's remorse. There is a difference between making markets transparent and making markets safe from errors by buyers or sellers.

- Broader consensus remains elusive regarding the impact of "paper barrels" on the crude price formation process.

- Speculation has become a buzzword used to lay the blame for "excessive" oil price volatility on financial investors, but speculation itself is more often than not poorly defined.

- There are clear benefits associated with the relatively recent entrance of financial players in crude, including the fact that they enhance liquidity levels.

- A "perfect storm" seems to have been brewing in 2008 for oil prices. The combination of diesel fuel policies and limited refinery capacity, Chinese demand, greater purchases of Chinese products driven by low US interest rates, supply disruptions in important producing

countries, thin spare production capacity, higher production costs and the belief in the peak-oil theory all may have contributed towards fuelling the rising price of crude oil. When the future behaviour of these factors came into question as a consequence of the financial crisis, greater volatility ensued, leading to the price fall at the end of 2008 and rise again in 2009.

- All in all, when assessing the oil market's performance and transparency in 2008, the crude oil price formation process—though not perfect—appears to have functioned better in comparison with the far larger credit and interest rate derivatives markets, as oil prices experienced a correction linked to fundamentals in a shorter time span.

- More and better quality data on refinery capacities and inventories, especially in non-OECD countries, might have helped to mitigate the volatility in 2008 by reducing uncertainty in the market.

- Policymakers should ensure that they have a comprehensive understanding of how to address and alleviate potential shortages or bottlenecks of refined products, notably diesel, gasoline and gasoil.

- High taxes on vehicular fuels mean that the fuels do not accurately reflect the real value of oil and the costs of production, and thus inhibit the conveyance of price signals. Subsidies tend to have the same effect on price signals.

2. BACKGROUND

The process through which world oil prices are determined has evolved over the last few decades towards greater decentralisation and closer interaction between physical and financial markets. An increasing number of actors participate in the daily matching of supply and demand bids. This process and its outcomes are scrutinised on a daily basis by policymakers, companies, consumers, institutional investors, hedge fund managers, journalists, and many other players, who are aided by advanced technology and communications tools.

To the extent that the contemporary process of price formation is efficient, it helps in the discovery of the true value of the last unit of oil traded (the marginal barrel), sending important signals for the allocation of resources linked to production and consumption alike. But if the process is inefficient, whereby observed prices fail to reflect fully the interplay of demand and supply forces, it can lead to a misallocation of resources with related costs to society and global energy security.

Considering the importance of price formation to the healthy functioning and development of world oil markets, the International Energy Forum (IEF) organised a Thought-Leaders Roundtable on Price Formation with the goal of better understanding the efficiency and transparency of oil price discovery. A small group of professionals representing the public and private sectors, energy exchanges and Price Reporting Agencies (PRAs) gathered in Vienna at the invitation of the IEF for a half-day of informal discussions. Conversations revolved around the process of price formation in oil markets and the role that PRAs play therein. Discussants exchanged views on the root causes of pronounced oil price volatility in 2008 and on energy-related policy and regulations.

The roundtable yielded a number of insights and touched on some challenging questions, which remain open for further discussion and analysis. Given the volumes of literature and media reports that have been written on the topic of oil price formation, and given the limited time that roundtable participants had for their discussion, this note is not intended to be a comprehensive reference. Instead, it is meant to help shed some additional light on what is widely-acknowledged to be a complex phenomenon.

The usual but important disclaimer applies to this as to all IEF dialogue reporting: none of the insights presented herein should be interpreted as the specific position of the IEF on this subject, nor can they be attributed to any individual. They arose from the informal exchange of ideas among the roundtable participants and are presented here in condensed form.

3. THE OIL PRICE FORMATION PROCESS: CAN OIL PRICES BE WRONG?

The process of oil price formation has drawn greater scrutiny since mid-2008, when the price of a barrel of WTI reached its most recent peak of US$147, plummeted to around US$30 in December that same year, and subsequently rose to the US$70 range in June 2009. What caused prices to change so drastically over such a short period of time? Was the oil market unable to price crude correctly? Were oil prices sending the “wrong” signals to crude buyers and sellers?

The IEF Thought-Leaders Roundtable began with a somewhat philosophical discussion on the accuracy of price signals in the eyes of market actors, and on the question many crude experts and policymakers are regularly asked: “What is the fair price of crude”?

One way to think about the fair or "correct" price of crude oil (or any other good or service) is to define it as the price at which both buyers and sellers agree to close a transaction.

One way to think about the fair or "correct" price of crude oil (or any other good or service) is to define it as the price at which both buyers and sellers agree to close a transaction. Following this line of thinking, the value of crude is never "wrong" or mispriced, because if one or both parties do not think the price is fair, no transaction will occur. This perspective assumes that numerous buyers and sellers act in their respective best interests in free and competitive markets. From this admittedly simplistic point of view, one might argue that there is little about current oil market price formation that requires fixing.

Yet crude price formation is not a simple subject. A simplistic view of the world wherein the price is never wrong does not take into account informational asymmetries between buyers and sellers, herd behaviour, effects on third parties, market bubbles, monopolistic or oligopolistic practices, and other so-called market imperfections with the potential to cause a divergence between the observed oil price and the one that reflects oil's scarcity value. From this perspective, prices can send the wrong signal unless appropriate measures are implemented.

4. PRICE FORMATION, PRICE REPORTING AND PRICE REPORTING AGENCIES

When attempting to better understand how prices are determined and disseminated, it is helpful to start by distinguishing between the process of price formation (also known as price discovery) and the process of price reporting. Price formation takes place through the interaction of numerous buyers and sellers in the oil market. It is what standard economic textbooks describe as the interplay between supply and demand in the determination of the price of any good. Price reporting is performed by companies known as Price Reporting Agencies (PRAs), which observe quoted prices from negotiations and prices referenced in closed deals.

While participants in the IEF Thought-Leaders Roundtable were familiar with the work of PRAs, some readers of this note may be less so.[1] In short, PRAs are privately-owned publishers and information providers that report oil prices in physical and some derivative oil markets. Some PRAs rely on interviews with market actors to gain insights into price levels. PRAs share the prices they assess with their customers, who include the buyers and sellers transacting in the physical oil market.

Buyers and sellers may choose whether or not to incorporate data from PRAs and numerous other sources into their decision matrices, but given the complexities of physical crude markets, some actors understandably rely on secondary sources of information, including price assessments and benchmark oil prices, to guide their decision-making.

PRAs assert that they are improving transparency in crude markets, and that they publish their views of the markets just as anyone else may. If observers question their assessments of the market price, then those observers are free to explain why they think the PRAs may have missed the mark. PRAs would find it hard to stay in business if they were consistently providing information that is not credible to their customers. Companies that purchase their services, whether on the demand or the supply side, are technically free to stop doing so. It is the case, nonetheless, that the industry has evolved to the point where the practice of relying on PRA-referenced contracts

1 For reference, Annex I includes background information on PRAs as described in an October 2011 Joint Report by the International Energy Agency (IEA), IEF, International Organization of Securities Commissions (IOSCO) and the Organization of the Petroleum Exporting Countries (OPEC) presented to G20 Ministers (hereafter referred to as the 2011 Joint Report).

limits companies' options, as taking their business elsewhere would entail a complex process of restructuring and potential renegotiation of many contracts.

While some characterise PRAs as passive observers of price formation, PRAs cannot categorically be considered absent from that process

While some characterise PRAs as passive observers of price formation, PRAs cannot categorically be considered absent from that process, as the price at which a buyer and seller close a deal today may well be influenced to some extent by the price that a PRA reported yesterday.[2]

Price reporting is thus an input into the price formation process for crude, and the quality of this input is of paramount importance. If PRAs provide unbiased information to buyers and sellers, it will help market actors discover the right price for a transaction. But if the information is biased in some way, the process of oil price formation is likely to incorporate that bias. The efficiency of price signals, in the sense that they reflect the opportunity cost of the marginal oil barrel, would therefore decrease.

5. PRAS IN THE REGULATORY SPOTLIGHT

The role of prominent PRAs in the oil market, such as Platts, Argus, and ICIS, drew more attention in light of the volatility of crude prices in 2008. Policymakers, regulators and analysts alike wanted to know if the methodologies the PRAs were employing were sound enough to reflect what was actually taking place in the physical market, and if they were robust enough to filter out any attempts at manipulation. In its 2012 report *Principles for Oil Price Reporting Agencies*, IOSCO identified "common vulnerabilities that could, if not addressed by appropriate controls and policies, result in an assessed price that is an unreliable indicator of the physical oil market value it is intended to reflect".[3] IOSCO pointed to the possibilities of "selective reporting" and "opacity and variations in assessment methodologies" as the root causes of the perceived vulnerabilities.

As discussed in the roundtable, though PRAs have recently come under the regulatory lens, related regulatory changes should be analysed carefully. Growing scrutiny and lengthening regulatory reach may lead some data submitters to become less willing to share data about oil prices with PRAs. Large market participants may consider prohibiting their employees from talking to anyone about any transaction, as the path of silence may present fewer potential legal entanglements. If not properly crafted, efforts to regulate PRAs might ironically engender greater transparency surrounding PRA practices but less transparency regarding oil prices, as the PRAs may receive fewer inputs and data points with which to work.[4]

Discussants at the roundtable underscored the importance of regulators not conflating the goal of greater transparency (which implies shutting down avenues for potential market manipulation) with the objective of eradicating market risk. While there is apparent consensus among policymakers that markets should indeed be as transparent as possible, policymakers should bear in mind that the availability of more information cannot in and of itself eliminate buyer's regret or seller's remorse. Markets by nature cannot provide full certainty to participants regarding outcomes (even

2 The point was raised in the 2011 Joint Report cited in Footnote 1 that the Platts that the Platts eWindow may be characterised by some experts as a trading platform, thereby service as an avenue for price discovery. The report recommended additional analysis to reach a conclusion on the matter.

3 The G20 Leaders' Cannes Summit Final Declaration (2011) states "Recognising the role of Price Reporting Agencies for the proper functioning of oil markets, we ask IOSCO, in collaboration with the IEF, IEA and OPEC, to prepare recommendations to improve their functioning and oversight to our Finance Ministers by mid-2012"; Principles for Oil Price Reporting Agencies, page 6.

4 This sentiment was also reflected in Point (viii) of the 2011 Joint Report, referenced in Annex I.

with insurance and other hedging instruments to protect against risk), especially in a dynamic process of price-discovery.

On the international level, a robust and sustained dialogue among regulators in different jurisdictions can facilitate cross-border policy coordination and to ensure that the "rules of the game" are clear to the private sector. One example of this type of coordination is illustrated through the G20-mandated recommendations from IOSCO.[5] IOSCO continues to work with PRAs and international organisations including the IEA, IEF, and OPEC to deepen the discourse among numerous stakeholders and market actors. Nevertheless, general concerns were raised regarding possible "regulatory overlap", wherein multiple regulators may set different policies for a single jurisdiction that could complicate the functioning of markets.

6. "PAPER BARRELS" AND SPECULATION

In addition to the growing scrutiny of the PRAs, the role played by financial actors in the price formation of crude has gained much attention in recent years, and key differences between the physical and financial markets for crude (the latter representing the so-called "paper barrels") are worth highlighting. The financial energy markets are based on the physical markets, as derivatives are financial instruments built upon underlying energy assets. In the financial or paper market, liquidity is high and there is in principle no limit or constraint on trading volumes, as participants can buy or sell any number of contracts. The physical market is inherently limited by the supply of crude available for sale. Some perceive that the physical market can constrain the futures or paper market, while others do not see limits from the physical market imposed on the financial market. If the financial market were to disappear tomorrow, there would still be a market price in the physical market.

Debates persist among market actors, academics and experts regarding the role that paper barrels play in the process of price formation.

Debates persist among market actors, academics and experts regarding the role that paper barrels play in the process of price formation. The degree of influence that financial actors exert in the market have been discussed at many roundtables and fora. The IEA, IEF and OPEC have to date held three joint workshops focused on the interactions between physical and financial markets for energy. Participants in the most recent joint workshop, which included a broad range of experts, "expressed the view that derivatives and physical transactions both play a role in oil price discovery".[6] Yet despite this finding, broader consensus remains elusive, and the impact of paper barrels on price formation remains a topic of debate. For some, the paper barrels are nothing more than an expression of the financialisation of energy markets; but for others, they clearly influence crude prices and moreover, are vehicles for potentially manipulative trading.

Speculation has become a buzzword used to lay the blame for "excessive" oil price volatility on financial investors, but speculation itself is more often than not poorly defined.[7] Market actors' decisions regarding storage levels or the use of financial hedging mechanisms, both potential tools in a prospective speculator's arsenal, may well be guided by commercial or precautionary motives, not necessarily by manipulative intent. A refinery might have reason to expect a supply disruption to occur in the near future and thus might buy crude for physical storage to compensate

5 The G20 Leaders' Cannes Summit Final Declaration (2011).

6 Joint IEA-IEF-OPEC Report on the Workshop "Interactions between Physical and Financial Energy Markets", held on 21 March 2013 in Vienna; Page 4.

7 "The Role of Speculation in Oil Markets: What Have we Learned So Far?" by Bassam Fattouh, Lutz Kilian and Lahan Mahadeva (2012).

for an expected loss in feedstock, or to lock in a price for future delivery using financial markets. Some might define this activity as speculation. Others might label that a wise business move in light of on-going market uncertainty.

Is it easier to identify "excessive" speculation? It would have to be driven by non-commercial and non-precautionary motives for increasing storage, of the type that is much more closely linked to efforts at market manipulation. In such a case, physical crude inventory build-up would be large and even observable, regardless of the number of paper barrel contracts. Even so, it is hard to distinguish the motives behind inventory build-up. An analytically useful definition of "excessive" in this context is elusive, and is primarily influenced by one's perspective.

Despite concerns regarding possible speculation, there are clear benefits associated with the relatively recent entrance of financial players in crude, and more broadly commodity markets. Perhaps the most prominent among them is that they enhance liquidity levels and help hedgers find counterparties for their trades.

7. REVISITING 2008: POLICY, DISRUPTIONS AND FINANCIAL MARKETS

Regardless of which part of the curve one analyses from the 2008-09 period, one point is clear: there was no single factor to explain the price volatility during that period.

After discussing the process of price formation, the roundtable participants shifted the conversation to the much-debated 2008 crude price shock, where the back end of the crude oil futures curve (up to five years out) demonstrated volatility levels typically characteristic of the front end. For the most part, price levels at the back end of the curve are determined by the marginal cost of production, while levels at the front end are driven by headlines. Regardless of which part of the curve one analyses from the 2008-09 period, one point is clear: there was no single factor to explain the price volatility during that period. This realisation should come as little surprise given the complex nature of oil markets.

Taking a closer look at the 2008 experience and what it implies for the price formation process, one fundamentals-based explanation raised at the roundtable points to legislation covering diesel fuel as having played a key role in the oil price increase. Prior to 2008, European and US policymakers had required refiners to lower the sulphur content of diesel fuels. The challenge therein was that most refineries lacked the capacity to produce the newly-mandated low sulphur fuels from heavy sour crudes. To produce the low sulphur diesel, the refineries sought light sweet crude (such as West Texas Intermediate crude), which tightened the supply-demand balance of WTI and drove prices higher. The oil industry eventually responded by building new, sophisticated refineries, but it took time for them to come on stream.

Demand side drivers that may have fuelled the rise in consumption to 2008 include economic growth in China, which was apparently stockpiling diesel fuel ahead of the 2008 Summer Olympics. Moreover, strong demand for China's manufactured goods meant massive volumes of diesel-powered trucks moving goods from ports to factories, and then bringing finished goods back to ports. The US trucking fleet was going strong as well, and additional demand pressure came from low US interest rates that were fuelling the real estate market.

On the supply side, disruptions in Iraq, Nigeria and Venezuela that affected their ability to bring more oil to the market played a part in sending crude prices higher. At the same time, production costs in the oil industry were higher than in previous years (deep-water oil was the new frontier and the unconventionals revolution had not yet realised its potential). Vocal advocates of the peak

oil theory may have also played a part in supporting expectations of restricted supply in the future.

In sum, a "perfect storm" seems to have been brewing in 2008 for oil prices. The combination of diesel fuel policies and limited refinery capacity, Chinese demand, greater purchases of Chinese products driven by low US interest rates, supply disruptions in important producing countries, thin spare production capacity, higher production costs and the belief in the peak-oil theory all may have contributed towards fuelling the rise in crude oil prices by mid-2008. When the economic crisis hit harder, it added uncertainty to these factors, causing a shift in expectations for future demand and oil prices fell towards the end of that year. Once these expectations stabilised and some growth resumed, prices increased yet again in 2009, and have displayed much less volatility since then.

Some experts at the roundtable posited that financial actors likewise contributed to this volatility. Proponents of the role of paper barrels as drivers of market prices point to the fact that pension funds and other asset managers had been encouraged to buy oil as a hedge against a weakening US dollar and because they were searching for a non-correlated asset to balance their portfolios. By one estimate, pension funds in OECD nations had around US$18 trillion in assets under management prior to the recent financial crisis. An allocation of just 5% of that total to the flat end of the curve could have impacted prices indeed.

To this day, believers in the physical barrels or fundamentals-based explanation continue to debate the root cause of the 2008 volatility with those who believe paper barrels played a major role. The market fundamentals side of the debate remains sceptical about the influence paper barrels may have had on the price of crude. After all, purchasing financial instruments tied to oil for future sale is not the same as storing barrels of oil in a drive to raise prices. A tight supply-demand balance may be caused by demand outpacing supply, not necessarily by inventory build. But since a drastic rise, fall, and rise again of oil prices took place in a relatively short period of time—without corresponding shifts in short-term fundamentals to explain the full cycle—proponents of the paper barrels explanation point to a different explanation, one in which either drastic changes in expectations or manipulative intent played a significant role.

All in all, when assessing the oil market's performance and transparency in 2008, roundtable discussants noted that the crude price formation process—though not perfect—appears to have functioned better in comparison with the far larger credit and interest rate derivatives markets, as oil prices experienced a correction linked to fundamentals in a shorter time span. Moreover, the price of financially traded commodities was relatively less volatile than non-financialised commodities.

8. GUIDANCE FOR POLICYMAKERS

Some roundtable discussants noted that inventories around 2008 were not considered to have been particularly tight, but this begs the question: inventories of which countries?

Shifting the conversation from what happened to what policies might have helped mitigate 2008's ups and downs, the ideas discussed during the roundtable focused on transparency, taxes, infrastructure, and rules on proprietary trading, among others.

More and better quality data on refinery capacities and inventories in selected markets might have helped to mitigate the volatility by reducing uncertainty in the market. Some roundtable discussants noted that inventories around 2008 were not considered to have been particularly tight, but this begs the question: inventories of which countries? Were market actors privy to comprehensive stocks data from non-OECD countries?

Five years after the price swings of 2008, experts at the Third IEA-IEF-OPEC Symposium on Energy Outlooks (Riyadh, 2013) focused on the importance of inventories outside OECD countries and highlighted the following points, among others:

- The role of OECD stocks and their forward demand cover is no longer an adequate barometer for oil market conditions;
- The absorptive capacity of non-OECD consuming countries, especially in Asia, is now a key to understanding oil balances;
- Non-OECD stocks are increasingly important to the market because they represent a rising share of the overall stock volumes.[8]
- The Joint Organisation Data Initiative's non-OECD crude and product stock data has a major role to play in resolving inconsistent supply-demand balances;

The above-mentioned points were likely relevant to some degree five years ago, and the idea that better stocks data--notably for non-OECD countries--might have mitigated the 2008 volatility underscores the need for policymakers to redouble their commitment to greater data transparency.

Policymakers should ensure that they have a comprehensive understanding of how to address and alleviate potential shortages or bottlenecks of refined products, notably diesel, gasoline and gasoil.

Taxes on vehicular fuels in developed countries, especially Europe, represent a significant portion of the price consumers pay at the pump. High taxes mean that the fuel prices obscure the real value of oil and the costs of production to the consumer, and thus inhibit the conveyance of price signals. Subsidies tend to have the same effect on price signals, plus adverse effects on conservation and climate change.

From the financial markets side, discussants suggested that had the Volcker Rule[9] been in place, it might have tamed some part of the excessive volatility as proprietary trading is perceived by some to have had a hand in the market swings.

9. ADDITIONAL THOUGHTS

More work on understanding the interaction between physical and financial markets will be needed to better understand the process through which prices changed so abruptly in 2008. A possible synthesis of the arguments under discussion might be based on the hypothesis that, while long-term oil price trends are determined by fundamentals—the factors that move physical demand and supply--short-term variations are influenced by both current fundamentals and expectations of the future balance between demand and supply. Expectations might therefore cause the short-term oil price to diverge from its long-term trend until the reality of physical supply and demand conditions forces a correction that brings prices in line with fundamentals. Without a clearly developed economic model and the support of evidence, however, such a synthesis is suggestive rather than conclusive.

8 Excerpts from presentations by David Knapp of Energy Intelligence and Joel Couse of Total. Complete presentations available at www.ief.org

9 Broadly defined, the Volcker Rule is intended to restrict banking entities from engaging in proprietary trading.

Other subjects that were raised but not discussed in depth during the roundtable because of time constraints, even though they are likely to influence the process of oil price formation in the coming years, include the following:

- The outlook for US crude export policy after the revolution in unconventional oil and gas, and implications on global competitive dynamics;
- The formulation of tax policy in Europe;
- Fossil fuel subsidies;
- The rise of electronic trading and its potential impacts on oil markets.

These factors affect supply, demand and price patterns, both current and expected. Understanding how they interact with other factors will help to enrich and enhance our collective understanding of oil price movements.

Participants in the IEF Thought-Leaders Roundtable on Price Formation included Christophe Barret, Stuart Brooks, John Brunton, Peter Caddy, Aldo Flores-Quiroga, Lu Feng, Zack Henry, John Mathias, Jorge Montepeque, Yasser Mufti, Neelesh Nerukar, Hans-Werner Polzin, Simon Smith, Namat Al-Soof, Glen Sweetnam, and Dong Fan Wang.

The insights presented in this document are for general reference on the diversity of perspectives expressed during the roundtable discussion. They should not be interpreted as reflecting the participants' consensus nor should they be taken to represent the specific views of the organisations that hosted the event, of the individuals who participated in the event, nor their employers. The purpose of the document is to inform and generate dialogue.

10. ANNEX I: BACKGROUND INFORMATION ON PRAs

Excerpts from the "Oil Price Reporting Agencies Report" by IEA, IEF, OPEC and IOSCO, presented to G20 Finance Ministers in October 2011[10]

i. PRAs are privately-owned publishers and information providers who report oil prices transacted in physical and some derivative oil markets, and give an informed assessment of oil price levels at distinct points in time, even when no actual deals have been transacted. A wide variety of market participants rely on PRA price reports, such as large oil producers, smaller independent producers, refiners, traders and taxation authorities.

ii. Benchmark oil prices assessed by PRAs are used as references for a wide variety of purposes, including the settlement of physical trades, standardised, over the counter and exchange-traded derivative contracts, the price indexation of natural gas contracts, and tax reference prices. The deal evidence on which PRAs assess benchmark prices is only a tiny fraction of the global petroleum trade.

iii. Some PRAs rely heavily on interviews with market participants to gain insights into price levels and other transaction-related information. Many industry participants and governments supplement PRA services with additional sources of information, including ship chartering information, tanker-tracking information, and proprietary consultants' reports.

iv. PRAs attempt to minimise the possibility that market participants use fraudulent or other manipulative procedures to influence prices. PRAs argue that their methodologies and their judgments are intended to weed out questionable transactions, trades that are not truly "arm's length", and bids or offers that do not legitimately represent market prices. However, PRAs often can observe only one part of a transaction, since offsetting transactions need not be reported to PRAs and there is no obligation on market participants to submit all relevant deals for consideration by a particular PRA.

v. The methodologies used by the PRAs show considerable variation. The methods of reporting data range from the almost entirely subjective approach adopted by ICIS (based on the first-hand extensive trading experience of its reporters), to the almost entirely mechanical approach of APPI (based on data submitted in writing to an accounting firm by a panel of traders). The two most significant PRAs in the oil market, Argus and Platts, use a combination of mechanistic analysis and judgment.

vi. PRAs openly describe their methodologies in detail. On individual days the different methodologies used by the various PRAs can cause the price reported by one PRA to differ from that reported by another PRA for the same crude benchmark. There is no evidence to suggest that there is a consistent upward or downward bias of any one PRA's reported data compared with another.

vii. With regard to market transparency, PRAs fill an important role of collecting, collating, editing and disseminating information. In the absence of PRAs, market participants would have to rely on alternative sources of information.

viii. In terms of regulating PRAs, many market actors consulted in conjunction with the preparation of the Joint Report expressed the view that bad regulation is worse than no regulation at all.

10 The full report is available here: http://www.iosco.org/library/pubdocs/pdf/IOSCOPD364.pdf