



# Economics for Business

The price of crude oil has oscillated like a bipolar bungee-jumper since the turn of the millennium. Perversely, the explanation for this involves a lack of elasticity.

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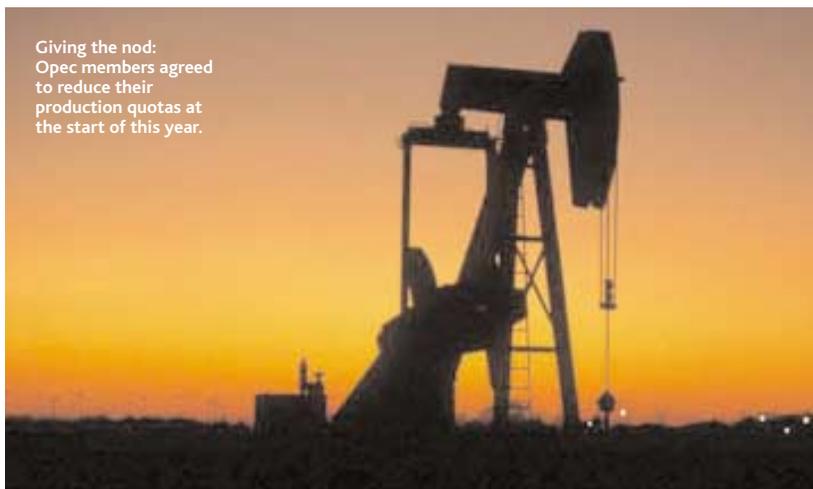
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In January 2000 the price of crude oil was about \$13 a barrel. By the middle of 2001 it had risen past \$30, only to drop to \$20 in early 2002. The price then went back up to \$30 and fluctuated around this level until late 2003 when it rose steadily, peaking at \$56 in October 2004. By the end of the year it had fallen back to \$42. Apart from equities, currencies and commodities – of which oil is arguably the most important – very few of the millions of goods and services produced worldwide have such a rollercoaster ride when it comes to pricing.

More goods and services undergo significant price fluctuations than we might think. We are all familiar with price-cutting on a wide range of items at certain times of the year – eg, the January sales – and these seasonal factors are strong enough to affect the general rate of inflation. Even so, the price changes are dwarfed by those observed in commodities.

Why should commodity prices change so erratically? The explanation lies in the special nature of commodity markets. Basic economic theory states that prices are determined by the interaction between the forces of supply and demand in a market. It should produce an equilibrium price where supply and demand are equal. In order to analyse market processes, economists have developed the concept of the “perfect market”. Such a market has a range of characteristics, including: many buyers and sellers; a homogeneous product; and perfect information for all. Under these somewhat unlikely conditions prices would be determined solely by supply and demand. A change in either variable would result in an instant change in price. No individual participant, whether buyer or seller, would be able to affect the market price on their own.

Of course, most markets don’t conform to this pattern and are imperfect: the number of sellers is limited; producers compete partly by differentiation; and perfect information is rarely available to all. The result is that producers have a degree of control over the markets, leading to the phenomenon of administered prices. Companies will set prices reflecting a range of factors – most notably, their desired profit margins and the perceived degree of competition. They then tend to keep prices stable unless there are major permanent changes to these



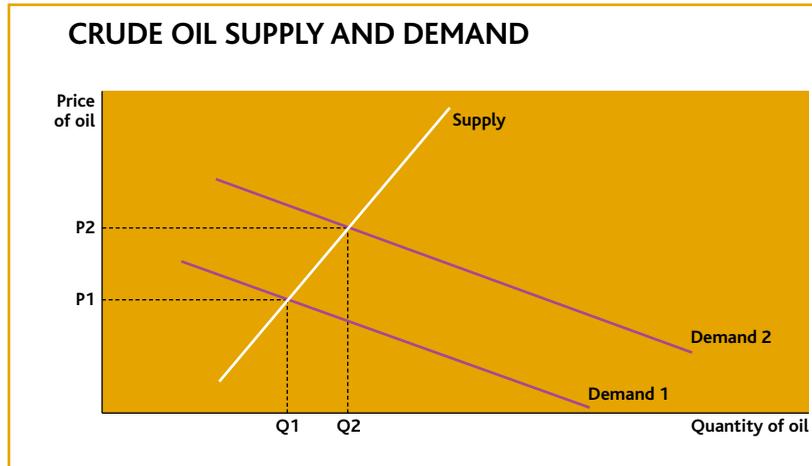
Giving the nod: Opec members agreed to reduce their production quotas at the start of this year.

factors. The act of altering prices incurs so-called menu costs, which makes sellers more reluctant to make short-term changes.

In the oil market the number of producers is limited and many of these are members of the Organisation of Oil Exporting Countries (Opec), a cartel designed to limit competition. But the product is homogeneous and so producers cannot compete by differentiation. Although several grades of oil exist, a high-quality light crude oil – Brent crude from the North Sea, for example – is in effect the same as a light crude oil extracted from any other source and is recognised as such in the industry. So a price can be established for a given grade and this price is well known. Anyone can check the daily price of different grades of oil by looking in the financial press or on appropriate websites. This isn’t possible in the case of most goods and services.

So the oil industry has a homogeneous product and ample market information – two of the key features of a perfect market. The implication here is that prices are closely determined by supply and demand. An increase in the demand for oil or a decrease in the supply of oil will inevitably lead to a price rise. The features of markets for other commodities and for shares and currency are comparable, producing similar results: single prices that may fluctuate daily according to supply and demand.

But the fact that the nature of the market for oil causes daily price fluctuations does not explain their magnitude. Between the start of 2003 and the autumn of 2004 the price more than doubled. This can be explained only by looking at the nature of



oil supply and demand. The standard model used by economists to analyse such processes tells us some useful things:

- Supply and demand might be affected by factors that have nothing to do with price.
- The demand for, and supply of, oil might be affected by the price. This can be represented by the slopes of the demand and supply curves. The relationship between changes in price and changes in demand or supply can be measured as the price elasticity of demand and supply. If the supply of oil does not change much in response to price changes, for example, it can be said that there is a high price elasticity of supply.
- A shift in either the demand curve or the supply curve for oil will affect both the market price and the quantities bought and sold. Whether the effect is mainly felt in terms of price changes or of changes in quantities bought and sold depends on the price elasticity of both demand and supply.
- Because consumers and producers both need time to react to price changes, the price elasticities of both supply and demand are lower in the short run than in the long run.

It's important to remember that we are mainly concerned here with the short run. This is defined as the period in which at least one factor of production – usually, but not always, capital equipment – is fixed. In the case of the oil industry the bottleneck appears to be the low level of spare capacity: it takes a long time to design, plan and build production facilities. As a result, the short run in economic terms might be several years for the oil industry. Over this time the price elasticities of demand and supply are both likely to be quite low.

In the short run the demand for oil is price inelastic – ie, it doesn't change much in response to price changes. This is because, even in the face of large price increases, it takes time to find substitute sources of energy or ways to economise on the use of oil. The large price increases of the early seventies did lead to the development of more fuel-efficient vehicles, for example, but this took many years to have an effect. Likewise, alternative

fuels do exist, but it takes time for the technologies to develop and for the capital investment to be made.

In the short run the supply of oil is also price inelastic, largely as a result of capacity constraints. Producers do not want to have expensive production facilities with high fixed costs lying idle when demand falls, so the industry often operates with a high level of capacity utilisation. When demand increases there is limited capacity to raise output from existing fields and facilities. Barclays Capital has estimated that it would take up to ten years for Saudi Arabia to increase production by half, for example<sup>1</sup>.

The recent shortage of oil tankers has exacerbated the problem, and ships of this size take years to build. There is also some evidence of a shortage of refining capacity – an increase in crude oil production is of little use if it can't be converted into usable fuels. Moreover, Opec acts as cartel and restricts output in order to keep the price above what would otherwise be the market equilibrium level. Although Opec's share of world production has fallen since the seventies, its output is large enough to be a crucial factor in determining prices. There is little evidence to show that Opec believes there's a medium-term shortage of production capacity, so the required investment in production facilities is not being made.

The large rise in the price of oil in the autumn of 2004 was, therefore, a reflection of producers' limited capacity to expand the supply in response to a big increase in demand, which had resulted from three main factors:

- Demand always rises in the autumn because of the increased need for oil for power and heating during the winter in the northern hemisphere. Oil is purchased in advance, meaning that demand in late summer and early autumn is determined by expected sales in the winter.
- The recovery of the major developed market economies boosted the demand for oil. Most western economies experienced a sharp fall in GDP growth as business and consumer confidence fell after the 2001 terrorist attacks. But by 2004 growth had recovered – most notably in the US, which is still the world's largest oil consumer.
- There is strong long-term growth in the demand for oil as a result of economic growth and structural transformation in the developing world. The most significant case is China, where GDP has been growing at an average of ten per cent a year for over a decade. This has been accompanied by a big shift in economic activity towards industry, which is a major consumer of energy. Similar processes have been occurring in other Asian countries, including India, Thailand and Indonesia.

So the producers' inability to increase output to meet this sharp increase in demand led to a steep price rise. In terms of the standard supply-and-demand diagram above, the demand curve shifted to the right from demand 1 to demand 2. Because the supply curve is price inelastic, the result is a sharp increase in price from P1 to P2. Conversely, if demand were to decrease significantly, the result would be a sharp decrease in price from P2 back towards P1.

The price of oil fell back in November 2004. The following factors contributed to this:

- There was a slight improvement in the supply as an earlier decision by Opec to increase the amount of oil that its members could produce took effect. Opec members are producing more crude than at any time in its history – some seem to be generating more than their agreed quotas. This is the equivalent of a shift in the supply curve to the right.
- Demand slackened off in anticipation of the reduced need for fuel in the spring in the northern hemisphere. Evidence from China of slower economic growth also had an effect. This is the equivalent of a shift in the demand curve to the left.

Oil is actually still cheaper now in real terms than it was in the seventies and early eighties. There's no doubt that changes in its price have less impact now than they did 30 years ago, when a major increase caused stagflation in the west. As the price of energy soared in the early seventies, developed economies went into recession as real incomes and real demand for consumer goods fell. The price rise was also a major cost shock, leading to a significant increase in the rate of inflation at the same time.

The effect of oil price rises on these economies lessened as the west reduced its dependence on the commodity. This was the result of an improvement in fuel efficiency and the decline of energy-intensive manufacturing. But a significant and sustained price increase in future would seriously damage most economies by depressing real incomes and raising the costs of production for virtually all activities. Also, because rising oil prices tend to shift real incomes from consumers in general towards the oil-producing economies, the effect would be to move money from those who typically have high marginal propensities to consume to those who have high marginal propensities to save. This creates a worldwide deflationary force. The important question, therefore, is what will happen to the price of oil in the long run?

The expectation must be that the real price will increase as a result of the following factors:

- Oil is a finite resource. Although there will be sufficient reserves for decades if consumption stays constant, there will come a point when output must decline.

- The most obtainable sources of oil are already being exploited. Future output must come from less accessible sources, which will be more costly to use.
- Most of the world's accessible reserves are in the Middle East, often in politically unstable countries such as Iraq. Consistent increases in output from this region cannot be guaranteed. Also, some analysts believe that reserves in Saudi Arabia, the world's biggest oil producer, have been overestimated<sup>2</sup>.
- Opec has an interest in maintaining a high price. At its December 2004 meeting it agreed to reduce its members' production quotas from January 1, 2005.

The long-term price rise might be mitigated by improving fuel efficiency. The car industry is making a big effort to develop vehicles powered by gas, electricity or nitrogen. Economic growth in developed economies is now mainly based on the service industry, which requires relatively low energy inputs. But these savings are being offset by the increasing use of petrol and diesel vehicles in the emerging economies of eastern Europe and Asia. And the continuing rapid economic growth and industrialisation in China and India are bound to increase the worldwide demand for oil. In the long run, therefore, the world will simply have to get used to ever-increasing oil prices. **FM**

#### References

- 1 C Smallwood, "Time to wake up to the danger oil prices will go still higher in medium term", *The Independent*, November 11, 2004.
- 2 L Halligan, "The west is deluded to rely on Saudi oil", *The Sunday Telegraph*, October 31, 2004.

## C4 Recommended reading

S Adams and P Periton, *Economics for Business Study System*, fourth edition, CIMA Publishing, 2003.

B Atkinson and R Millar, *Business Economics*, FT/Prentice Hall, 1999.