

## Crude oil price hikes and issues for energy security for Southern Africa

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### Abstract

*This paper addresses a number of issues related to crude oil prices, focusing on Southern Africa. It begins by analysing oil price movements from 1970 to 2008, and examines various factors that may have contributed to the sharp rise and fall in prices. A characteristic feature in the oil market is the time lags it takes to react to price changes. A high oil intensity of GDP makes the economy vulnerable to oil price increases, so that countries with a high oil/GDP ratio are harder hit than others. There are two main issues for energy security: first, on whether the potential use of the oil weapon can be taken seriously; and second, how to minimize vulnerability to oil supply shocks by reducing oil dependence and by a developing or enlarging a strategic stockpile of oil.*

*Keywords: oil price shocks, vulnerability, oil weapon, strategic petroleum reserve*

### Introduction

The volatility in the price of oil the past four decades reflects much more than the usual supply and demand dynamics. Oil prices have been soaring not because of any threats about oil depletion but largely as a result of political factors and increasing Chinese and Indian demand for oil, which all combined, to make oil markets nervous. The period of cheap oil ended in the 1973. It came back in the period 1986 to 1994. Oil's dominant share in energy use was largely because of the relative ease with which oil is substituted for any other fuel in any type of energy use. The direct effect of higher oil prices is felt through the contraction of the economy and its ability to restore the balance of payments equilibrium.

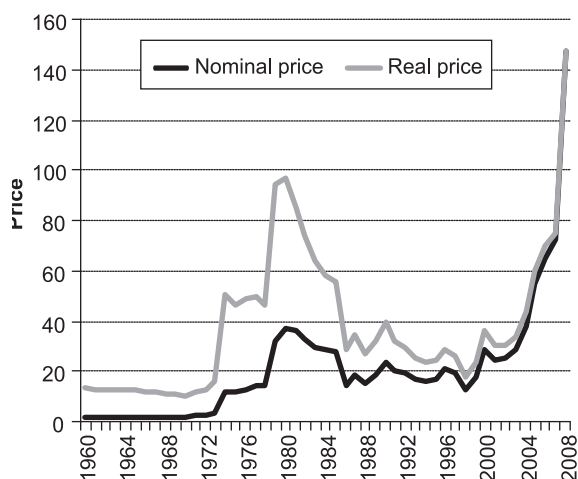
This paper addresses a number of issues related to crude oil prices, focusing on Southern Africa. The first section analyses oil price movements from 1973 to 2008, and examines various factors that may have contributed to the sharp rise and fall in prices.

Under the impact of oil price shock in the second section, the discussion is about the changing impact of oil price shocks, and coping with higher oil prices. In the final section, attention is on two main issues for energy security: first, whether the potential use of the oil weapon can be taken seriously; and second, how to minimize vulnerability to oil supply shocks by reducing oil dependence and by a developing or enlarging a strategic stockpile of oil.

### Oil price movements

#### Oil markets

Figure 1 shows actual price movements in the crude oil market as well as wide fluctuations in the price of Brent crude oil overtime. By mid-2008, the oil price had risen to unprecedented levels, greater than that recorded in 1980. For oil importing Southern African countries, the impact of higher prices depends on factors such as the length of time the price rise lasts and the oil intensity of the economy, bearing in mind that the demand for oil is price-inelastic in the short-term.



**Figure 1: Oil price movements**

*Source: Data extracted from BP Statistical Review (2009)*

A characteristic feature in the oil market is that consumers and producers usually take time to react

to price changes. The long time lags, which account for the slowness of the reaction to price changes, arise mainly because: (i) market responses usually result from long run price expectations rather than current prices; (ii) switching from oil to other fuels requires investment in new fuel-consuming equipment; and (iii) substitution may require investment in new supply and transport facilities. As a result, the long run price elasticities are greater than short run elasticities.

### **Explaining price spikes**

#### **1960 – 1973**

Even after the founding of OPEC in 1960, crude oil prices continued to fall up to the early 1970s. By this time, large multinational oil companies known as the 'seven sisters' – Exxon (Esso), Shell, British Petroleum, Gulf Oil, Texaco, Mobil and Socal (or Chevron) – dominated the oil industry. These companies disposed of almost three quarters of internationally traded crude oil through their vertically integrated systems (Robinson, 2001), smoothing out fluctuations which would normally occur within those systems. OPEC at the time was concentrating on gaining greater control over its members' level of production, and was beginning to exert its economic and political strength.

The decline in the price of crude oil, in real terms, worsened in 1971 and 1972 with the decline of the United States dollar. For Southern African economies as well as other buyers outside of the USA, a falling dollar lowered the local currency price of oil selling at a fixed dollar price. The fall in crude oil's current prices coincided with the period when coal prices were generally rising, resulting in the substitution of oil products for coal and its products, both for energy and chemical use in many countries, and when there was steady economic growth with no severe recessions, and limited price sensitivity of oil demand. Coal's dominance had largely been because of its convenience of use and relatively low price. Favouring oil's prominence, on the other hand, was its flexibility of use, smoothness in its supply and distribution system, and its importance as a 'swing' or 'balancing' fuel in the energy systems of most countries.

#### **1973 -1978**

OPEC, at this time, was more of a price follower, meeting occasionally to agree on *de facto* prices already realised in the market (Robinson, 2001). Two different but interrelated developments seem to have been the primary cause of price increases in 1973. First, were changes in property rights as oil-producing countries with comparatively low discount rates took over the production of oil from the 'seven sisters', which had abnormally high interest rates because of anticipated nationalisation. The rising oil consumption and misguided fears that oil

would soon run out generated expectations of rising crude oil prices. Second, at the same time, the oil weapon (or an Arab embargo on oil exports) was deployed against 'unfriendly states' in retaliation for supporting Israel during the Arab-Israeli conflict in 1973. The targeted states were the United States, its allies in Western Europe, Japan, Rhodesia (now Zimbabwe), and South Africa. Arab nations curtailed production by 5 million barrels per day not to reap economic benefits, but to achieve a political objective. This demonstrated the problem of dependence and vulnerability to oil supplies. However, the oil weapon did not achieve its intended purpose as these states obtained their crude oil supplies from other sources although at higher cost. Thus oil prices quadrupled largely because of the short-term elasticity of oil demand and in anticipation of further disruptions, leading to a rapid accumulation of oil inventories.

Because of the dependence of the industrialized world on crude oil, oil price increases were dramatically inflationary. It is interesting to note that for the Japanese economy a major effect was to shift investments away from oil-intensive industries towards electronics industries. At the same time, the crisis also provoked debate by 'optimists' and 'pessimists' on the nature of crude oil resources, led to calls to conserve energy and to greater interest in renewable energy and increased oil exploration, and increases in the West's dependence on coal and nuclear power.

The shortfall following Arab curtailment of production was met by increased production of about 1 million barrels per day in other countries, and the net loss (of 4 million barrels per day) was extended through March, 1974. Crude oil prices, in real dollar terms, declined moderately from 1974 to 1978. Oil consumption continued to grow, and the oil price was sustained at a high level by the underlying competitive forces and structural changes.

#### **1979 – 1989**

The second price shock (1979-1981) was largely triggered by supply cuts and panic-buying following the Iranian Revolution and the ensuing Iran-Iraq war. As with the 1973 energy crisis, the artificial shortage of oil, rather than other factors, led to price increases. OPEC increased oil prices by 60% between January and June 1979, more than offsetting the 1975 – 1978 declines in real oil prices. The world price of oil reached a peak of more than US\$90 per barrel.

Interesting reasons account for the subsequent decline in oil prices. OPEC did not remain the principal force determining oil prices and output. By the mid-1980s, OPEC countries had significant excess productive capacity. This followed new discoveries in and increased production from non-OPEC countries because of both higher oil prices and new tech-

nology (Fattou, 2004). Although the quantity of OPEC oil demanded was starting to increase, production of some non-OPEC countries fell as price collapsed in 1986. This reduced OPEC's spare capacity to very low levels. Saudi Arabia, the 'supplier of the last resort', tried to increase its market share by increasing its production. This combined with cheating/chiselling on quotas by member states and/or overestimation of demand for OPEC oil exerted a downward pressure on prices and further weakened OPEC's ability to stabilise oil markets.

#### *1990 – 1998*

The 1990 spike in the price of oil, caused by the Gulf War, was milder and briefer compared with the 1973 and 1979 crises. During most of the 1990s, crude oil prices fluctuated above \$20 per barrel. High price volatility is observable in 1990 – 1991 and during the Asian crisis in 1997 and 1998. Crude oil prices fell during 1998 below the 1973 level because of slowdown in the growth of energy demand worldwide and increases in oil supply. Oil consumption in 1998 was lower than anticipated.

#### *1999 – 2001*

Figure 1 shows that oil prices fell to their mid 1970 levels (in both real and nominal terms). In March 1999, OPEC countries pledged to cut oil production with some non-OPEC members (notably Mexico and Norway) pledging additional cuts in exports. But not all of the quotas were observed even though OPEC production fell by about 3 million barrels per day. Prices fluctuated in the \$25 to \$30 range in the first half of 2000, and continued to display volatility. The three successive OPEC quota increases did not halt price increases. Prices finally fell with the November quota. Crude oil prices continued to decline in 2001 as global economic activity slowed and with growth prospects dampened. Prices plummeted with the September 11 attack.

#### *2002 – 2008*

From Figure 1, the pronounced upward pressure on prices from 2002 is attributable to strong world economic growth which led to strong world oil demand. Main drivers behind growth in oil demand included growth in consumption particularly from China, the US, and the Middle East, with China and the US accounting for half of the world oil consumption growth in 2007. While high oil prices slowed economic growth in most countries, the Chinese economy grew by 11.4% in 2007, reaching its highest level in 13 years. Growth in Chinese oil demand is attributable to its high rates of growth in economic output and personal income. While high growth in incomes and demographic changes have resulted in increased demand for oil in the transportation sector, increased industrialisation, on the other hand, is driving the high demand for diesel,

petrol and petrochemical feedstock. Global growth in oil consumption was stimulated by the decline in the value of the US dollar which made oil less expensive in terms of local currencies.

Prices increased further to US\$ 70 by the end of April 2006. Leading factors at play were the upswing in demand propelled by industrialisation in China and India, and prolonged shortage of spare capacity to pump and refine crude. By September 2007, the West Texas Intermediate (WTI) reached \$80.36 a barrel stemming from tension in Turkey and the continued weakness in the US dollar. Prices broke through the \$100 price barrier in January 2008 exacerbated by further factors as follows. First, the turmoil in Nigeria and Algeria and tensions between the West and Iran raised questions that supply would not keep up with rising demand. Second, the falling US dollar put upward pressure on oil prices as the purchasing power of the OPEC barrel decreased. Crude oil prices remained volatile, reaching a record high of US\$147 by the July 2008, adding to the global inflationary environment. Worries about how energy prices were affecting the global economy, added to worries about the strengthening of the American dollar and declining demand in industrialised nations. These factors as well as continued fears over global recession caused oil prices to plummet, reaching \$43.25 by mid December 2008.

### **Impact of oil price increases**

#### ***Changing impact of oil price shocks***

In all, there are two periods of large sustained increases in oil prices but with different economic impacts, with the first period covering the first three oil price shocks (1973/74, 1979 to 1980, and 1999 to 2000), and the second period from then on. The first period is characterised by a combination of inflation and recessions (or stagflation) following the price shocks. Key issues behind stagflation were the initial cost push inflation followed by expectations formation of continued steep price rises which became self-actualising. The rising prices meant falling real incomes and declining demand. Attempts to control prices using interest rates exacerbated the problems. The overall impact on restrained GDP growth is predictable, given oil imports become more expensive. High oil prices were thus associated with slow economic growth, increasing inflation, and rising unemployment. For the second period, the ailments of the first period did not appear. Instead, growth was sustained and inflation was moderate. Variations in exchange rates were not as great, and high oil prices were associated with a decrease in government expenditures and low interest rates (Alhajji, 2004).

All the price shocks in the first period were associated with conflict and substantial decreases in oil supply. For example, substantial price increases

were associated with: the 1973 Arab-Israeli war; the 1978 Iranian revolution; the 1990 Iraqi invasion of Kuwait; and the run up to the American war in Iraq. For the second period, there were several other factors that contributed to the upward pressure of prices and increased demand for oil. Among these were uncertainties associated with oil supply disruption in Iraq, production disruptions from Venezuela, the decline in world inventory levels, the sharp increase in Chinese imports, and a decline in Japanese nuclear energy output which in turn increased the demand for oil to replace it as an energy source.

### **Coping with higher oil prices**

Except for Angola and the Democratic Republic of Congo, which are net exporters of crude oil, dependence on imported crude oil ranges from 95% (South Africa) to 100% (for the rest of the countries), making Southern Africa very vulnerable to price increases (Nkomo, 2006). Higher oil prices increase the cost structures and worsen the terms of trade of oil importing countries which have to pay more per barrel of oil. With rising oil prices, prices burgeon in most sectors of the economy as costs in manufacturing, distribution and transportation increase. A high oil intensity of GDP makes the economy vulnerable to oil price increases, so that countries with a high oil/GDP ratio are harder hit than others. Indeed, the severity of the impact (on the balance of payments, growth and welfare) of higher oil prices will also depend on other factors such as the country's share of oil in the total energy mix, and the monetary and fiscal response.

A relevant question is whether to look for price or quantity based policies in order to cope with higher oil prices. Quantity based policies focus on restrictions on the consumption of oil products. Price-based policies, on the other hand, work through the price mechanism, and are therefore preferred for efficiency reasons. Price-based policies entail provision of taxes, subsidies and measures to reduce the domestic costs of supply of products. Government can tax oil to account for its vulnerability, or provide direct subsidies targeted to certain fuels and indirect subsidies through reduction in taxes on petroleum goods. Familiar objections to using the market mechanism rest on equity grounds rather than economic efficiency. Objections are mainly on grounds of economic distribution effects of the oil tax. To predict the effect of taxes on demand, price elasticity estimates of oil demand become vital. If, on the other hand, the preferred policy option is to reduce reliance on oil, energy efficiency improvements become important especially where such measures reduce oil intensity.

## **Energy security issues arising from rising oil prices**

### **Oil weapon**

There are often arguments that the degree of dependence on oil imports makes oil-importing countries vulnerable to use of oil as a weapon. Following this line of thought, oil can be used as a tool of retaliation or to get political concessions against oil importing countries, raising fundamental concerns about the security of oil supplies. The only serious case of the use of an oil weapon was during the 1973 energy crisis, where an attempt was to wield it as a political instrument. As Mabro (2007) observes, this remained as nothing more than a public relations spin.

Several reasons account for the failure of the oil weapon as an instrument. It is difficult for a seller to isolate a particular importing country, and then wield an oil weapon to punish, because oil is widely traded (Adelman, 2004). There is usually nothing binding for countries that do not fall under the embargo to obtain and redirect oil supplies to those under the embargo. More so, OPEC countries are usually not agreed on production cuts. Even if oil exporting countries cut back on oil supplies, supplies from elsewhere would counteract any loss. The case of sanctions against then Rhodesia and South Africa, where oil was used as a weapon, revealed particular limitations in enforcing such measures.

These arguments lend support to Mabro's contention that the oil weapon is a blunt instrument that cannot be applied in a focussed manner or for any sustained period. This weakens any worries about the potential use of oil as a threat to security of supply. While concern about security of supply is valid, supply can be threatened by a host of potential events such as beyond the control of the importer (for example, civil unrest in exporting countries, etc), and this is different from the case of oil as a potential weapon.

### **Oil dependence**

Given the high dependence on imported crude oil, reducing oil dependence implies reducing the oil intensity of the economy if Southern African economies are to be less exposed to high oil prices and oil price hikes. Reducing oil dependence makes sense if the economies increase their ability to substitute energy and other non-energy sources for oil or by energy efficiency improvements. Since demand is inflexible or inelastic in the short run given the time required to change the oil consuming equipment, oil dependence therefore means reducing vulnerability to oil dependence costs.

Many governments think they can reduce dependence from a particular supplier by diversifying sources of oil supply. The merit of the argument is that increased reliance does not promote security and economic threats stemming from oil depend-

ence. But this does not mean that diversifying sources eliminates threats to which consuming countries may be vulnerable since oil price hikes affect all economies regardless of sources of imports. Oil independence will not shield any of the Southern African countries from oil price shocks as long as imported volumes are significant. In order to enhance energy security, governments may pursue policies that correct both competitiveness and correct market failures. Government intervention, for example, is necessary to address any fear of oil shortages. An expected intervention is in building strategic petroleum reserves to be used during the time of oil shortages, as long as the strategic reserves do not replace commercial stocks.

### **Strategic petroleum reserves**

The purpose of the Strategic Petroleum Reserve (SPR) is to reinforce energy policy and energy security. A more focused SPR is used as a hedge against economic impact of future short-term supply disruption, and is more effective than other response measures such as demand restraint and fuel switching. This way, the SPR ameliorates supply crises and combats any physical oil shortage that may arise. The SPR is therefore best suited as an emergency oil supply, when it can be tapped until supplies are restored. South Africa's SPR, with a storage capacity of 45 million barrels, and Malawi's reserve facility to contain enough crude oil to replace oil imports for five days (being expanded to 21 days), all indicate that by their size SPR can ameliorate temporary disruptions but are not large enough for long-term disruptions.

There are some points to consider. First, the SPR is not intended to be a buffer stock to affect prices but to provide insurance against supply disruptions. Given the size of SPRs in Southern Africa, using it to dampen oil price hikes by releasing stocks at a lower price cannot last long. The oil price would revert to its previous level leaving the SPR empty and unable to serve its intended purpose of compensating a supply shortfall by releasing oil from its stockpile. Second, the best time for starting the strategic reserves is when prices are at their lowest, as this brings down the cost of storage. Third, the real threat in recent years has been more of price spikes than supply disruptions

### **Finale**

Increases in price throughout the period have largely been the result of factors 'above the ground' and not 'below the ground', and factors outside the control or influence of Southern African countries. The problems, however, have had to do with geopolitics rather than poor growth in the supply of crude oil. Far from being an oil depletion signal, crude oil prices have been high because of political instability in some OPEC member countries, weaknesses in

the US dollar (oil is traded in dollars), and large increases in demand from the huge developing economies of China and India. The fundamental control by OPEC producers still cannot be disputed, since these economies are depended on oil export revenues.

Just as with the 1973/4 oil price shock aftermath, there are now increased calls to conserve energy and greater interest in renewable energy and other possible energy substitutes. Southern Africa is heavily dependent on imported crude oil and therefore subject to all sorts of vulnerabilities. Energy security, in this context, should address the impact of these vulnerabilities so that vulnerability to oil shocks is also a function of strong commitment to strengthen energy security

### **Note**

The views contained are those of the author and do not represent the views of IDRC

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Received 30 January 2009; 9 April 2010