

Global Development Network:  
Tenth Annual Conference on “Natural Resources and Development”

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**Natural Resources, Economic Growth and Future Generations:  
How to Create a Win-Win Outcome for Everyone? <sup>1</sup>**

**Abstract**

The GDN Kuwait conference focuses on natural resources and takes place at an extraordinary moment: the sharpest changes witnessed for decades in the global economy. Resource prices have been remarkably volatile, confirming their past record of boom-bust cycles. Oil prices have been especially volatile, even compared to their history of past fluctuations and shocks. High and uncertain oil prices harm both producers and consumers; they also harm the environment to the extent that they motivate heavy investments in costly, high-CO<sub>2</sub>-intensive synthetic fuels. This is a good time to consider how management of large natural resource rents can be improved in exporting countries, and how oil producer and consumer countries can work towards a more cooperative approach to reduce economic costs of extreme volatility while improving the environmental footprint of the energy sector.

**Natural Resources, Economic Growth and Future Generations:  
How to Create a Win-Win Outcome for Everyone?**

**INTRODUCTION**

This GDN conference is centered on the theme of natural resources and development. The timing could not be better. We are witnessing the sharpest global changes that any of us can remember. Until only a few months ago, many of our concerns were with global overheating. We faced soaring food and fuel prices, in some cases exacerbated by export bans. Many vulnerable countries and communities faced economic stress, insecurity and deprivation. Today we stand at the edge of global deflation, with a commodity price collapse and sharp downgrades in growth levels and forecasts extending across the world.

The current global crisis is expected to have major consequences for development – and especially for the world’s most vulnerable populations: the poor. Given the huge

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<sup>1</sup> I thank Alan Gelb and Sina Joy Grasmann for help in preparation of this speech. The views expressed in this paper are those of the author and should not be attributed to the World Bank.

fluctuations in natural resource prices, it is particularly the poor in natural resource exporting countries that will suffer.

Although the current situation looks particularly grim from the perspective of resource-based development, we should take it as an opportunity. Crisis can provoke re-thinking and force necessary policy changes. This situation will not prevail indefinitely, and the current configuration of resource prices is probably not permanent. One test of our leadership and capacity will be whether the foundations will have been laid for more effective approaches to resource management and resource based development when the global crisis ends.

## **THE GLOBAL ECONOMIC SITUATION – AND LIKELY TRENDS.**

Up to 2007 the global economy was doing well. Growth rates had been high for a long time. International trade was expanding, liquidity was high and private capital flows to developing countries were soaring to over \$1 trillion.

Today the picture looks very different: Even though the US Congress moved quickly to create a \$700 billion rescue fund back in October 2008, the risk case laid out by US officials in September when making their case for the rescue package is now the base case outlook for the US economy. In 2008 2.6 million people lost their jobs, and the US experienced the largest slump in employment since 1945. Even in Asia, the motor of global growth, exports are contracting at an unprecedented rate. As output and trade contract, unemployment is rising not only in the US, but across the world.

In short, even as there are signs that global financial markets may be starting to unlock, what began as a financial crisis has evolved into a global contraction. Economic globalization has increased the rate of transmission of the financial crises from one country to another. We are facing a period of financial deleveraging, great uncertainty and slow growth.

**Things can get worse before they get better.** Thanks in part to rapid government interventions there are some signs of financial side easing. Risk premiums in the interbank lending market have declined as lenders have grown comfortable with the support provided by recapitalizations and funding guarantees. In the US the 3-month dollar Libor – the benchmark rate paid by banks to borrow from each other for a period of three months – has come down sharply from its peak in early October 2008. Several developing countries have recently offered successful sovereign issues.

However the crisis is far from over. US and other housing markets are showing further signs of weakness, factory orders are falling, and consumer confidence is down. The picture has been darkening in successive assessments.

**The crisis will have a severe impact on developing countries.** Growth in developing countries averaged 7.8 percent in 2006-07. It has recently been projected to slow to 4.5 percent in 2009, and this is increasingly looking to be on the high side, with the prospect

of a further percentage reduction to about 3.5 percent. While the channels of transmission may differ, virtually no developing country, be it an emerging market country or a poor country in Africa, has escaped the impact of the widening crisis. Some countries may have been protected so far from the direct effect of the financial crisis because of their limited exposure to sophisticated securitized instruments in developed country markets. They will however be affected via other transmission channels.

**Developing countries will be affected by the crisis through five main channels:**

- Foreign direct investment and private capital flows have fallen, and can be expected to continue to fall given tight liquidity in developed countries and weaker growth prospects in developing countries. Our latest *Global Economic Prospects 2009* report released in mid-December 2008 projects a halving of financial flow to developing countries – from about \$1 trillion to \$500 billion.
- World trade volumes are likely to contract in 2009 for the first time since 1982, and with a falling demand in industrialized countries, developing countries will face big drops in their exports. Political pressures for more protectionist policies could gather force, including through industry-focused programs, though the pledge made by the G-20 in this regard is encouraging.
- Growth of remittances will slow sharply, and may decline in some countries. Remittances to developing countries have been growing at about 18% in recent years and reached an estimated \$283 billion in 2008. Current expectations are that they will fall in 2009, perhaps by as much as 6% to \$267 billion. Remittances from the Gulf are likely to decline more than the global average.
- Official aid flows are likely to be affected by tighter budgets in advanced countries which even before the crisis were falling far behind their Gleneagles commitments.

Finally, of particular importance for resource-rich countries:

- **Commodity prices are falling, almost across the board.** Commodity prices saw a positive trend after 2003, reaching their peak in the first half of 2008, but have since fallen very sharply. Copper prices are at less than half their peak; oil prices are about one quarter of their peak levels. Many developing countries rely on primary commodity exports and sharp swings in a country's terms of trade can seriously disrupt output growth.

The collapse in commodity prices will drive sharp changes in developing countries' terms of trade. Some 30 countries are expected to gain more than 1.5 percent of GDP from the decline in oil prices (World Bank, 2009). And the fall in food prices will help to ease both external and fiscal positions (as the cost of food subsidies declines) for many of the world's poorest countries, including Benin, Eritrea, Ghana, Guinea, Haiti, Madagascar, Niger, Senegal, and Togo.

At the same time, oil exporting countries will experience large terms of trade losses, with Angola, Azerbaijan, the Republic of Congo, Equatorial Guinea, Gabon, the Islamic Republic of Iran, Kuwait, Libya, Nigeria, and Saudi Arabia incurring first-round income losses in excess of 10 percent of GDP. Weaker metals prices are anticipated to reduce

incomes by more than 2 percent of GDP in Chile, Mauritania, Mongolia, Papua New Guinea, Suriname and Zimbabwe (World Bank, 2009).

Within Sub-Saharan Africa, for example, the top gainers in 2008 were all oil exporting countries-- the top losers in 2009 are also oil exporters.

These are of course not the first major shocks to affect developing countries. Many countries have also become more vulnerable to terms of trade shocks as the extended period of high fuel and food prices led to deteriorations in their external positions over the last years. One third of developing countries have been running current account deficits of 10% of GDP or more prior to the economic downturn.

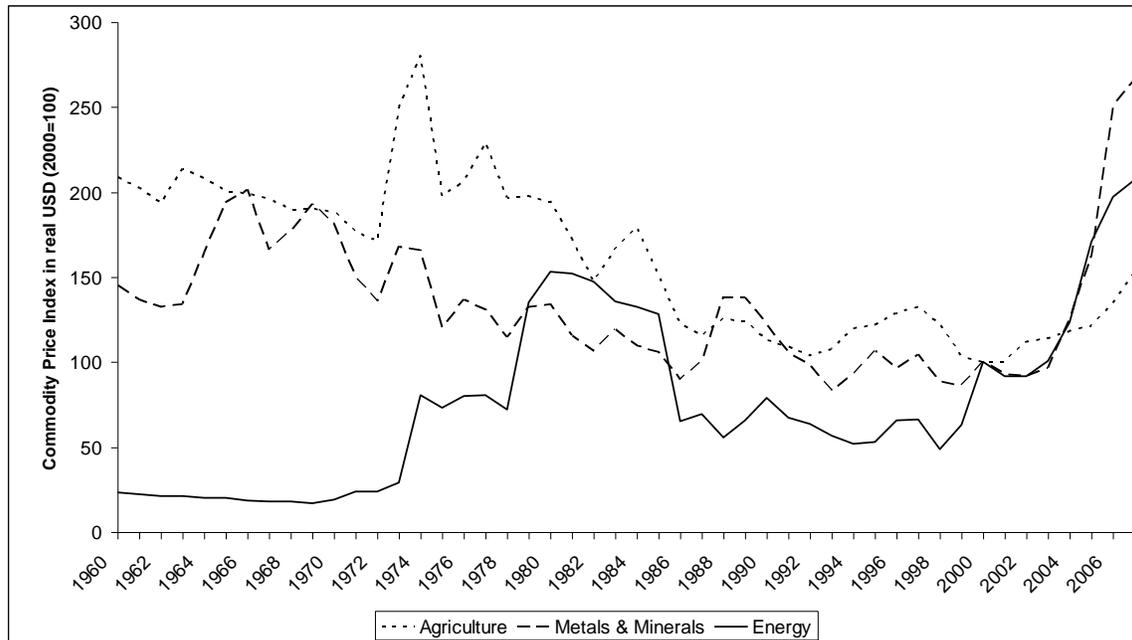
### **THE CURRENT COMMODITY SITUATION IN HISTORICAL CONTEXT**

While this is an extreme situation, boom-bust episodes are common for commodity markets. We have now just passed the third great post-war commodity boom: the first came after the Korean War, the second in the 1970s and early 1980s. Price booms can differ in origin. The current episode has been demand rather than supply driven. As a consequence of low investments in commodity exploration and exploitation in the 1990s (given that rising demand for oil and metals was largely being met by the rehabilitation of already existing capacity in countries from the former Soviet Union), spare capacity was exhausted by 2000 and demand began to outstrip supply, pushing up fuels and metals prices, especially given the strong demand growth from China, India and other rapidly-growing emerging market economies. Weaker demand across OECD member countries, appreciation of the dollar, and concerns about demand prospects in the wake of the financial turmoil then resulted in the sharp commodity price drop towards to end of 2008.

Resource prices across different commodities have often moved together (Figure 1). In this case they certainly did so; the latest commodity boom was not confined to one commodity or to a single group. Crop prices soared, including for maize, wheat and rice; metals prices rose, including for copper, nickel, lead and steel. Nickel prices have now fallen below the marginal costs of high-cost producers. China's import demand has been weak in 2008, and the slowdown in global housing construction more broadly contributed to diminishing demand for metals.

**The particular case of oil.** The most noteworthy fluctuations have been for oil. This time round prices began to increase in the early 2000s; they tripled from \$20 to \$60 per bbl between early 2003 and mid-2005; a second phase gathered steam after early 2007, and saw prices rocket to over \$147 per barrel in July 2008 before falling back to \$34 in December 2008 – its lowest value in over four years.

**Figure 1**  
**Resource Price Trends: 1960-2007**



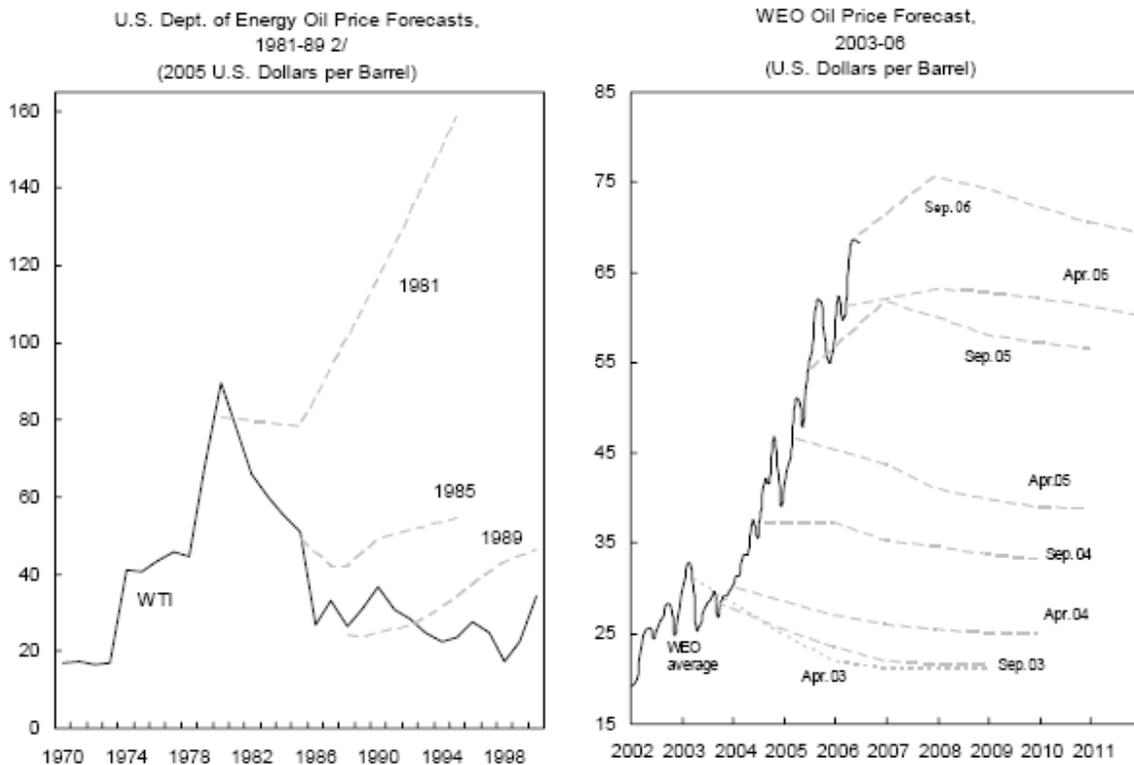
Source: World Development Indicators, World Bank

Extreme though these changes are – they are not outside the realm of historical experience. There is ample evidence that oil prices exhibit significant volatility in the short run and very large fluctuations over the medium term. One study found a one in three chance of a monthly oil price change greater than 8 percent (Cashin, Liang and McDermott 1999). The average annual oil price change in 1970-2005 was 27 percent (IMF, 2007). Nevertheless the magnitude and duration of the most recent commodity price boom are unprecedented. The upswing lasted five years and this boom was longer and stronger than any in the 20<sup>th</sup> century.

Oil price changes also seem to be almost impossible to predict. Price projection scenarios and forecasts have often been wildly wrong (IMF, 2007: Figure 2). Many expected prices to continue increasing after the peak in the early 1980s; more recently, futures prices have simply projected current prices out into the future. Hamilton (2008) finds that neither lagged behavior of real oil prices, U.S. nominal interest rates nor U.S. GDP growth rates are useful predictors. Instead, real oil prices seem to follow a random walk without drift. Hamilton’s study asked an interesting question: given oil prices at \$115 per bbl, what is the likely range of prices four years out into the future? The answer was: high, \$391, low, \$34. No one would have considered the latter as remotely likely at the time this study was done. Yet prices hit \$34 only a few months later.

We believe that this phase is temporary, and our projections are that they will recover with world demand, though not to their previous peak levels. But the range of uncertainty in any forecast is very high.

**Figure 2**  
**Oil Price Projections and Forecasts: 1970-2011**



Source: U.S. Dept. of Energy Annual Energy Outlook (1982, 1986, 1989); and WEO documents.  
1/ The hard lines are spot oil prices. The dotted and dashed lines are price forecasts.  
2/ West Texas Intermediate (WTI) crude oil.

Why have oil prices been so volatile? I suggest four main reasons:

**First, the lack of suitable alternatives, especially in the transport sector.** A large part of oil use is in transportation where inter-fuel substitution is still extremely limited in anything short of the long term. The range of feasible alternative is wider in power generation.

**Second, supply is relatively fixed in the short-term once output approaches capacity.** Capacity is price inelastic in the short term; major programs to increase and diversify supply, for example, from deepwater wells, have a long gestation lag. Fluctuations in international business cycles tend to destabilize commodity demand and hence prices, more rapidly.

**Third, market price mechanisms do not work as smoothly for oil as they do for other commodities.** National oil companies now control 90 percent of global oil and gas reserves and 75 percent of production (Gelb and Grasmann, 2008). Such a degree of public control can result in reduced consumer confidence about the extent to which oil supply will be adjusted to market demands. A private profit maximizing firm is expected to invest in spare capacity and successfully adapt output to the demands of a competitive market – and thereby maintain more stable output prices. The same is not necessarily true of governments. Their willingness or ability to increase capacity in response to price rises can be limited by geo-political concerns or violence in oil-producing regions. On the downside, they will be highly dependent on oil revenues to keep their country going, and may find it difficult to cut supply in response to reduced demand.

Another factor limiting the price mechanism is the high proportion of energy consumption that is subsidized. Many countries maintain price controls on petroleum products or otherwise subsidize energy use. Energy subsidies in the 20 largest non-OECD economies reached \$310 billion in 2007 (IMF, 2005; IEA, 2008). Domestic prices for petroleum products are often held far below world market levels. In the short run, this may be an understandable response by exporters to a sharp rise in world prices; there is little point in subjecting the economy to a supply shock and at the same time tempting fiscal expansion by further boosting swollen public coffers. However, in the longer run, subsidized consumption fails to respond to global oil price changes. It rises even in the face of scarcity, which further boosts market-based global energy prices.

Not only does this hurt countries that do not subsidize oil. For the countries that subsidize the oil fiscal costs can be substantial, on the order of several percentage points of GDP. Cheap energy policies tend to be regressive, inefficient and difficult to reverse. Spiraling domestic demand (including demand inflated by smuggling) and resistance to adjusting prices, even with inflation, often makes them unsustainable.

**Fourth, partly because of the sensitivity of spot prices, oil price expectations can be highly volatile, and these are reflected in futures prices.** There is some debate on how much of the recent price swings can be attributed to speculative activity, including by so-called “index investors” eager to move into commodity-based assets which were seen as another asset class. In very simple models we have arguments that profitable speculation should, on average, be stabilizing and that prices fluctuate less than they would without speculation. Indeed, some acute observers recently recognized that prices would return to more fundamental values, perhaps with a sharp correction.<sup>2</sup> However, excessive speculation can amplify price swings already started; the futures market could set prices too high if a speculative bubble were underway, similar to what happened during the dot-com stock episode. While one wave of speculators might lose, this might not prevent further waves entering, believing that they can do better.

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<sup>2</sup> Testimony of George Soros before the Senate Commerce Committee, June 3, 2008, available at [[http://commerce.senate.gov/public/\\_files/SorosFinalTestimony.pdf](http://commerce.senate.gov/public/_files/SorosFinalTestimony.pdf)]

Unfortunately maintaining large inventories and precautionary stocks for oil stabilization will not be cost efficient. It is likely that large buffer stocks will continue to be used as strategic reserves against significant supply disruptions, rather than to stabilize price levels.

## **IS THERE A WIN-WIN OUTCOME FOR OIL PRODUCERS AND CONSUMERS?**

The oil price game today is no longer the same as the one played in the 1970s. In the 1970s there were only two main players: oil producers and oil consumers. We could model this as a bilateral bargaining process between consumer and producer interests and as a zero sum game: when oil prices are high oil producers are winning and oil consumers are losing, and vice-versa.

Of course, producers and consumers are not homogeneous. Some producers have modest reserves and a short production horizon, some have large reserves and a very long horizon. If adjustment to sustained high or low prices takes time, the interests of these producers can diverge.

Today, there is a third interest that needs to be considered: the environment. Mitigating CO<sub>2</sub> emissions and adapting to a warmer and more volatile climate represents a huge challenge, to oil exporting and oil importing countries, and developed and developing countries alike. As the world warms, economic activity will be affected by a host of challenges, ranging from sea level rise to water stress (a particular concern in the Middle East), from higher uncertainty about optimal crop choice to more severe and costly extreme weather events. Climate stress can push ecological systems to tipping points, and exhaust households' coping capacity. It may also overload health and social security systems, and fan conflict.

The poor, whether in low or middle-income countries, are especially vulnerable. They tend to be more dependent on climate-sensitive sectors, such as agriculture and fisheries, and have less capacity to adapt, whether through access to information, technology and capital, or through the ability to diversify income sources.

From this perspective, a mutually beneficial arrangement – involving both price and assurance of supply -- would be one that encourages investments into cost-competitive renewable energy and energy efficiency, and limits large-scale, irreversible investments into costly and highly CO<sub>2</sub>-intensive synthetic fuels.

The danger is that instead of reaching such an arrangement, we settle into a lose-lose equilibrium. Persistent high oil price volatility could result in periods of extremely low oil prices – discouraging investments into renewable energy and energy efficiency, lowering investments into oil exploration and extraction technology, resulting in huge fiscal deficits in oil exporting countries – followed by periods of extremely high oil prices which could lead to lower output and higher inflation in oil importing countries and unsustainable booms and risky borrowing against future incomes in oil exporting

countries and at the same time greater uncertainty, which increases incentives to invest in costly and polluting synthetic fuel production.

**Lower oil price fluctuations are a win-win for all.** For all interests, including oil importing and oil exporting countries and the environment, more stable oil prices are a win-win.

For oil consumers high oil price volatility raises uncertainty, increases demands for costly self-sufficiency, and induces inefficient resource reallocation.

- **Uncertainty, including about future oil prices, causes delays in irreversible business investments** (Bernanke, 1983 and Pindyck, 1991), leading in turn to a long term reduction in output growth, reduced macroeconomic activity and higher price levels. This will have a negative effect on corporate profits, unemployment and GDP growth. With the current financial turmoil, we are seeing the impact of uncertainty now, on a massive scale. The late 2008 freezing of credit markets, collapse of stock markets, large shifts in exchange rates and commodities prices, and unprecedented policy reactions have combined to create an extremely uncertain environment. The effect could be a decline in world GDP for the first time in the postwar period.
- Uncertainty induces costly resource reallocation from more sensitive sectors to less adversely influenced areas (Hamilton, 1988). It increases transaction costs for consumers and producers, adding to inflation or reducing GDP growth, or both.
- Uncertainty also increases the incentive for self-sufficiency, including higher use of coal to produce highly CO<sub>2</sub>-polluting synfuels and increased carbon emissions.

Volatility may be more costly than a simple increase in the average oil price. Using a measure of volatility constructed from daily crude oil futures prices Guo and Kliesen (2005) find that over the period 1984-2004 oil price volatility has had a significant and adverse effect on various key measures of the U.S.A. macroeconomy such as consumption, fixed investment, employment, and the unemployment rate. They suggest that a simple oil price increase matters less than increased uncertainty about the future direction of prices.

**In oil exporting countries the destructiveness of boom-bust cycles is clear from many cases:**

- Mexico borrowed against expectations of increasing real oil prices after 1981 and suffered badly when these expectations turned out to be far off track.
- Venezuela was one of the fastest-growing Latin American economies, with growth averaging 6.4 percent. But following several euphoric boom years after 1974, it experienced a sharp decline, with output per head halving over the next two decades.
- Nigeria offers a third example, with “voracious” spending increases outpacing revenue increases up to 1984, followed by sharply lower spending debt-constrained spending thereafter (Budina and van Wijnbergen 2008).

Many countries have approached the recent boom more cautiously. But some have over-extended themselves, and will probably face difficult choices in the next years, especially with risk-averse financial markets. Pro-cyclical credit markets amplify price cycle effects: exporters can borrow when prices are high and increasing; but when they are low and falling they close down.

In contrast more stable prices can make it easier for exporters to plan ahead, and to pursue sound fiscal and monetary policies and public expenditure plans. For oil importers, they increase predictability; reduce the option value of waiting to make business investment, and lower the incentives to develop highly polluting synfuels.

**What energy price levels might constitute a win-win?** Once we agree on the importance of avoiding extreme price fluctuations we need to consider what range of oil price levels might be mutually beneficial. Such a range for oil prices would be one that is low enough to make high-volume production of highly polluting synthetic fuel uncompetitive, but would still encourage continued investments in alternative energy sources and increase emphasis on fuel efficiency.

Indeed, while Saudi Arabian oil minister Ali Naimi agreed that high volatility was the biggest issue facing the oil market he also noted the importance of levels: "The world's present financial climate is clearly one that inhibits innovation," he said. "Oil prices must be maintained at a level that encourages investment, especially in alternative energy sources."<sup>3</sup> One significant challenge in achieving such a balance is that higher prices may do even more in the market to stimulate development of polluting synfuels over lower-carbon energy sources, given the current state of technology.

**Low oil prices will reduce incentives to invest in low-carbon energy resources and energy efficiency, and could reduce public support and financing for further innovations in these areas.** A combination of efficiency gains and new technologies is necessary to lower the carbon content of output at a competitive price and ensure effective action against climate change.

**High oil prices – according to some studies, prices significantly higher than \$70 a barrel – and uncertainty over future prices could result in an increased substitution from petroleum-based fuels towards highly polluting coal-based synthetic fuels unless and until there are stronger international agreements in place to curb carbon emissions.** The raw material (coal) is available in quantities sufficient to meet current demand for centuries, but there will be a high environmental cost associated with increased investments into synthetic fuels. Coal based synthetic fuels can produce greenhouse gas emissions that are roughly double those of petroleum-based equivalent. Emissions of other pollutants are higher as well, even though many of these can be captured during combustion.

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<sup>3</sup> Vencat, Emily Flynn and Jane Wardell (2008). Oil producers call for more price stability. Wtop.com, December 19, 2008. Retrieved online on 01/16/2008 from <http://www.wtopnews.com/?nid=111&sid=1554259>

## **GOING FORWARD: HOW TO SUPPORT A CONSTRUCTIVE OUTCOME?**

With the world economy confronting systematic macroeconomic and financial risks, short-term attention is naturally focused on dealing with the immediate crisis. This may require some extraordinary measures, interventions that would not be appropriate in more normal economic times. From a longer-term perspective, concerns are of a somewhat different nature. How will developing countries emerge from the current downturn? Will they retain the underlying strength, confidence, and strong macroeconomic fundamentals that underpinned the record growth of the past five years?

**Will resource exporters take the opportunity to optimize their development programs and policies?** How can natural resource revenues be managed better? There is a wealth of literature on this topic, and I will only briefly allude to a few points. Studies indicate that the quality of institutions and human capital is critical in determining how well natural resource rich countries use their natural resources to encourage growth. Resources only have a negative impact on growth performance among countries with inferior institutions. A high proportion of “point-source” natural rent in an economy (from oil or minerals) may encourage rent-seeking, reducing transparency and deteriorating governance, and also creating incentives for countries to follow development strategies that are not in accord with their comparative advantage.

With natural rents currently lower, this may be a good time to review the use of resource revenues and build stronger systems, to ensure quality and increase transparency, and develop a more long-term focus. Resources need to benefit entire countries – not just a small political elite – during both high and low price periods.

The current climate may also provide a window of opportunity for implementing a Charter for Natural Resource Revenues (Collier 2007). This could provide for improved transparency around oil revenues and public expenditures, better risk sharing between private natural resource companies and governments, and the development of rules for smoothing public spending in the face of revenue shocks.

The current bust should also remind natural resource rich countries of the importance of economic diversification. They should seek to derive lessons from countries which have diversified successfully, and have complemented their natural capital with investments in physical and human capital and in governance capital.

**How can oil exporters contribute to reducing volatility and maintaining oil prices at a win-win range?** Oil exporters have an interest in sustaining more stable prices and supply, both for their own development and to discourage the development of synthetic fuels. While there are costs to making investments necessary to ensure sufficient spare capacity for increased market stability, undertaking such investments and providing reliable information on levels of spare capacity could lower consuming-country fears of high and unstable prices. In the long run increased investment, new discoveries and

improvements in extraction technology can boost spare capacity and reduce the likelihood of high oil price volatility during periods of high demand.

**What can oil importers do to support a win-win outcome?** Oil consuming countries also have an interest in greater stability, and in the environment. They should seek to not undertake massive investments into environmentally damaging synfuels. They might need, however, to invest in additional research and demonstration level investment in this area, to create a credible threat against the possibility of sharp and persistent increases in world oil prices.

Governments could also support a range of policies to encourage greater energy efficiency and increased use of renewable energy sources. With respect to oil use, policies such as tax benefits for fuel efficient cars, a kilometer per ton charge on heavy vehicles (after the Swiss model), and the elimination of fuel tax exemptions for airlines, all are options. In addition, governments need to support greater investments in the longer-run development and diffusion of renewable energy sources.

**This may also be a good time to reduce fuel subsidies in both oil exporting and oil importing countries** to make consumption more responsive to global price changes.

**Finally, could there be possibilities for multi-period insurance against price extremes?** Hedging mechanisms are used surprisingly little by oil exporting or importing countries. Some of the reasons are technical and some are political, including the risk to officials of being accused of incompetence or corruption if the deal turns out badly. Yet, accepting that fluctuations in resource prices may be inevitable – can we envisage contracts that could help to insure countries against extreme events? For example, could poor consuming countries be insured against the possibility that oil prices exceed \$100 over a 10 year period, or producing countries insured against excessively low prices?

## CONCLUSION

The timing and theme of this conference is opportune, for both resource producers and consumers, as well as for researchers.

For producers, now is the time to consider improvements in economic policies and management that will improve on the past record of resource-based development.

For consumers, this is a good time to increase economic flexibility, including by phasing out energy subsidies.

For both, it is the right time to search for a more cooperative approach which will serve common interests and also recognize the challenge of the climate change agenda. Such a solution has to include incentives for renewables in the long run but discourage costly investments in high CO<sub>2</sub>-emitting oil substitutes in the shorter-run.

This is a challenging agenda, with many unknowns. Research needs to rise to the challenge.

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