

“Price Revolution”: Technology Innovation, Productivity Enhancement Vital

By Akira KOJIMA

Global prices of energy resources have been gyrating amid massive speculative investment and a slowdown of the world economy triggered by the financial turmoil originating from the United States. However, if you put aside the portion of price fluctuations caused by speculative factors and look straight at the fundamental pricing trend of energy and other natural resources, you will clearly see that the world has plunged into an era of higher prices in the 21st century (*CHART 1*). We need to think that the equilibrium point with energy resources in supply/demand and price terms has undergone a basic change. The basic trend of energy prices tells us that energy resources have gained an upper hand in relative price terms over industrial products that use such resources. We may call this situation a “price revolution.”

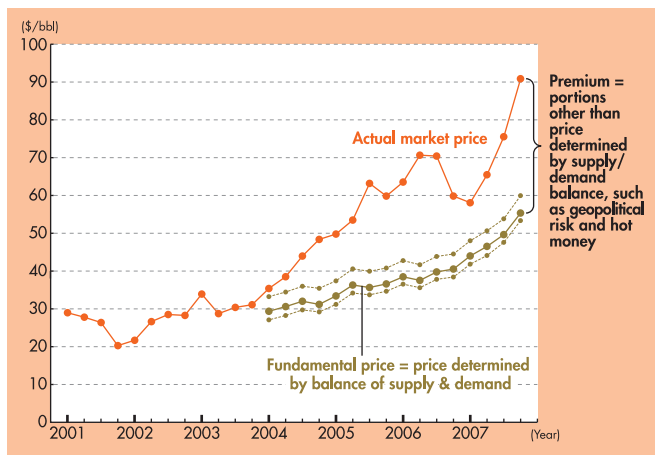
The world needs to respond to this revolution with changes in economic and industrial structures and lifestyles. And that response can be accelerated by technological innovation and productivity enhancement.

Japan’s Response to Oil Crises

The two oil crises in the 1970s ended up with stagflation – a complication of a global economic recession and inflation. The Japanese economy faced an annual inflation rate in excess of 30% and slipped into its first negative growth since the end of World War II. Within years of the oil crises, however, Japanese industry came out with new technologies and products highly efficient in terms of energy and resources. This brought about a significant drop in unit energy consumption and a substantial improvement in the economy’s energy efficiency. The rest of the world hailed it as a “new miracle attained by the Japanese economy.” What this might suggest is the importance of technological innovation and productivity improvement in meeting the problems of energy resources.

As compared with the days of the 1970s oil crises, the high energy

CHART 1
Fundamental price & premium of crude oil



Source: Institute of Energy Economics, Japan

prices we see today are due more to structural factors. They represent a sort of structural change likely to stay over a long period of time. Technological innovation is all the more important in this situation.

OPEC Strategy Backfires

Let us try a more detailed comparison of the situations in the 1970s and today. The two oil crises were precipitated by the artificial supply cuts enforced by the Organization of Petroleum Exporting Countries (OPEC) in the midst of the Middle East war. Oil prices were marked up in short bursts. It was a supply shock caused by price hikes levered by supply reductions.

The actions taken by OPEC were aimed in part to reverse the relative price disadvantage of crude oil over products turned out by industrialized nations. In those days, the world’s industrial development was led by advanced economies, where the basic price trend was characterized by what was then termed creeping inflation. In contrast, most countries that supplied resources were in a state of chronic deflation. Industrial products constantly enjoyed a relative price advantage over natural resources. The discontent of supplier countries burst out in the form of OPEC’s oil strategy that led to the supply shock.

The world economy in those days was based on a structure where industrial products had a relative price advantage. For this reason, OPEC’s artificial oil price hikes backfired after a while. In the 1980s, crude prices went on plummeting. Saudi Arabia, for instance, fell into financial difficulties due to reduced oil revenues, being forced to borrow money from the rest of the world. Industrial products regained their relative price advantage.

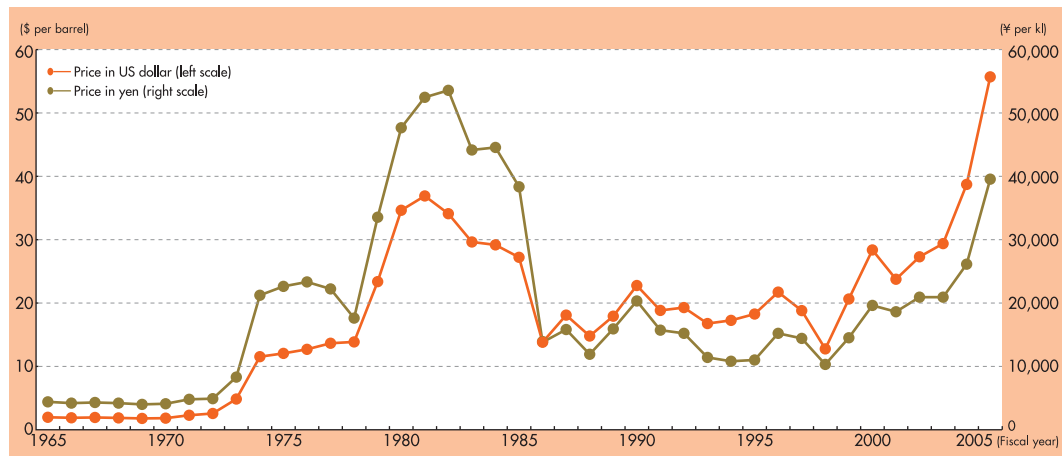
Energy Picture: Structural Change

The current upsurge in the prices of oil and other energy resources may be called a “third oil crisis.” This differs fundamentally from the scenario seen in the 1970s. In the first place, it is not a supply shock created by artificial supply cuts by producers. The higher prices come from robust demand for energy resources. In 1973, OPEC quadrupled crude prices at one stroke. This time around, crude prices edged up over a longer period (*CHART 2*).

There are several factors that support strong energy demand. First, the world economy had grown at high rates until quite recently. Second, industrialization has progressed in a rapid and sustainable way in China and other emerging economies that had kept a low profile in the 1970s. Third, these emerging economies are powered by heavy consumption of energy resources, one of the characteristics seen in the primary stage of economic development. In other words, the higher prices have resulted from the rapid global economic expansion fueled by heavy energy consumption.

In this process, prices have begun to go up in an abnormal manner

CHART 2
Trends of crude oil import price (nominal value)



Source : "Trade Statistics of Japan," Ministry of Finance

since around 2007 as speculators scooped up oil and other energy resources. At the moment, speculative investment is losing steam as the world economy has begun to decelerate amid the financial crisis touched off by the US subprime mortgage woes. However, what is different from the 1970s is that despite the lull at the moment, the relative price advantage held by energy resources over industrial products is likely to stay over a longer period because of the strong growth potential of the emerging economies highly dependent on energy resources.

Put another way, the relative price advantage between industrial products and energy resources and the terms of trade between them will stay reversed. Japan has scant energy resources at home. Since the early stage of its industrialization, it has relied on processing trade by importing relatively low-priced energy and other resources, turning them into value-added products and exporting them to the rest of the world. Now Japan is faced with the need to change the economic development model it has held for years.

Energy Inflation, Product Deflation

Global demand for energy resources stays strong because countries that turn out industrial products with them have dramatically increased in number. The labor cost in emerging economies that push ahead with industrialization is much lower than that in advanced economies. They can put out similar products at a substantially lower cost. This factor works to push down global prices of industrial products. What this mechanism has entailed is the price inflation of energy resources and price deflation of industrial products.

Japan, in particular, has experienced deflation since 1998, the year after the currency crisis hit Asian countries. The Bank of Japan has devoted its basic policy to departure from deflation. Even after energy prices began to surge, the pace of rise in Japan's consumer price index (excluding perishable foodstuffs) hovered around 1% year-on-year in the first half of 2008, though it accelerated to the 2% range in the second half.

The situation in Japan is different from that in the 1970s. Even before the oil crisis broke out in October 1973, the Japanese economy had been in a stage of inflation, with demand outpacing supply. Consumer prices had gone up more than 10% in the January-September period of that year. The oil crisis added to the inflationary spiral. Wholesale (corporate goods) prices surged more than 30% and consumer prices jumped 25% in 1974. The rise in the prices of oil-related products was almost appalling. The whole nation panicked as consumers rushed to buy toilet paper rolls, tissues and detergents while shops held back sales. Amid strong final demand, manufacturers could easily pass the higher import

CHART 3
Forecasts of majority of Policy Board members

| | Real GDP | Domestic CGPI | CPI (excluding fresh food) |
|-----------------------------|-------------------------------|-------------------------------|-------------------------------|
| Fiscal 2008 | +0.1 to +0.2 [+0.1] | +4.3 to +4.8 [+4.6] | +1.5 to +1.6 [+1.6] |
| Forecasts made in July 2008 | +1.2 to +1.4 [+1.2] | +4.7 to +5.0 [+4.8] | +1.7 to +1.9 [+1.8] |
| Fiscal 2009 | +0.3 to +0.7 [+0.6] | -1.4 to -0.4 [-0.8] | -0.2 to +0.2 [0.0] |
| Forecasts made in July 2008 | +1.4 to +1.6 [+1.5] | +1.8 to +2.0 [+1.8] | +1.0 to +1.2 [+1.1] |
| Fiscal 2010 | +1.5 to +1.9 [+1.7] | -0.3 to +0.5 [+0.3] | +0.1 to +0.5 [+0.3] |

Notes: 1. Figures in brackets indicate forecast medians.

2. The forecasts of the majority of Policy Board members are constructed as follows: each Policy Board member's forecast takes the form of a point estimate, namely the figure to which he or she attaches the highest probability of realization. These forecasts are then shown as a range, with the highest and lowest figures excluded. It should be noted that the range does not indicate forecast errors.

3. Individual Policy Board members make the above forecasts with reference to the view of market participants regarding the future course of the policy interest rate - a view that is incorporated in market interest rates.

Source : Bank of Japan "Outlook for Economic Activity and Prices" as of October 31, 2008

cost on to their sales prices. Some of them went too far, resorting to opportunistic price hikes that emerged as a social problem.

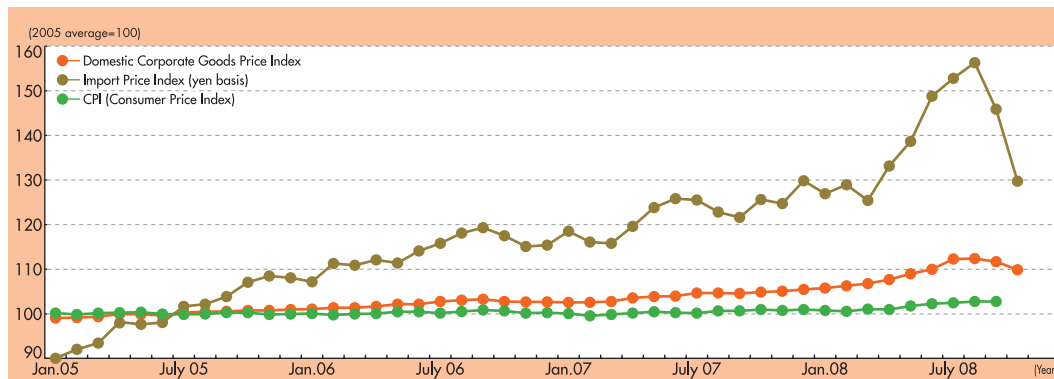
Key Response: Technology Innovation

In contrast with those days, consumer prices in Japan remain stable now (CHART 3). The economy is in the final phase of its departure from deflation. In Japan, the rise of global energy prices automatically leads up to higher prices of imported commodities. In fact, the import price index went up 15.7% in fiscal 2005, 10.9% in fiscal 2006, 8.0% in fiscal 2007 and more than 20% in the July-September quarter of 2008. Normally, higher import prices are reflected in corporate goods prices. This time around, however, corporate goods prices went up only 6%-7% and consumer prices rose a modest 1%-2% in the same quarter (CHART 4).

This indicates that it is hard to pass on higher import prices of energy resources to domestic prices. Higher cost that cannot be shifted onto prices eats into corporate profit.

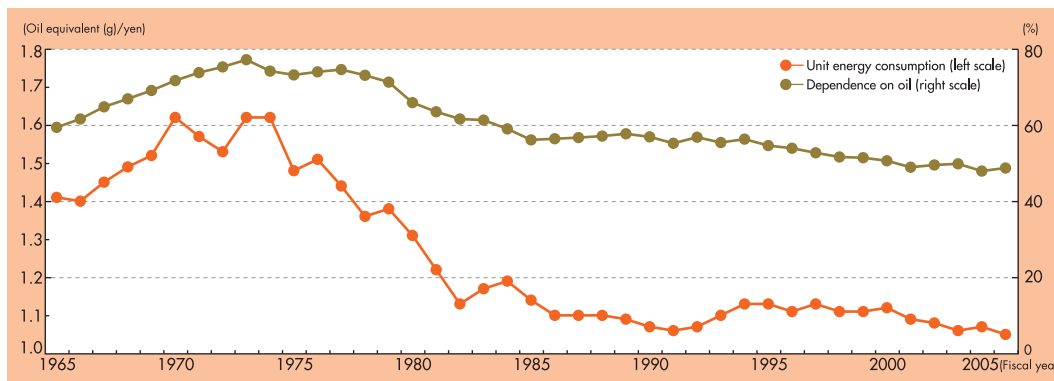
Fishermen, forwarders and other quarters plagued by higher fuel prices are either suspending their operations or walking out in a show of their anger, forcing the government to consider relief measures for them. However, such a quick fix can be no more than a political lip service as

CHART 4
Changes in main price indexes



Source : Bank of Japan and Statistics Bureau, Ministry of Internal Affairs and Communications

CHART 5
Trends of unit energy consumption



Notes : Unit energy consumption = Total energy supply/real GDP ; Dependence on oil = Total oil supply/total energy supply
The method of calculation used in "Total energy statistics" in and before fiscal 1990 is different from that used today.
Source : "White Paper on Energy 2007", METI

long as the root cause of the problem lies in the "price revolution," that is, the reversal of the relative prices of energy resources and industrial products. A fundamental response to the price revolution ought to be technological innovation and productivity enhancement based on it. During the oil crises in the 1970s, Japanese companies developed numerous technologies and products that can save energy and resources. These helped to turn Japan into an economy that consumes less energy and other resources. The fuel-efficient cars from Toyota and Honda were born out of their efforts to address the price revolution with new technologies.

Structural Policies Essential

During the first oil crisis in 1973, the US government counted on domestic oil resources and took a policy to curb gasoline price hikes. It thus helped to prevent a global price revolution. As a result, the automakers in Detroit fell behind in the development of energy-saving technologies. In retrospect, that was a prelude to the crisis Detroit faces today.

While oil prices declined in the 1980s, Japan tended to slack off its efforts for technological innovation. Its unit energy consumption, a gauge of an economy's energy efficiency in generating GDP, went down little in the 1990s (CHART 5). Efforts to improve energy efficiency were continued by some Japanese manufacturers. Overall, however, such efforts were slow.

Amid the global financial crisis and economic deceleration, a major challenge facing Japan is to stir up aggregate demand at home through timely macroeconomic policies. But that will not be enough. Rather than toiling for demand-stimulating measures, the government should look straight at the price revolution and provide an impetus to technolog-

ical innovation that can change Japan into an energy-saving economic society friendlier to the environment. That is far more imperative.

Needless to say, Japan must act in concert with other countries in addressing the ongoing financial turmoil. However, we should know that the price revolution will continue even after the financial crisis has been overcome. Speculative investment that added fuel to the abnormally high energy prices may die down as the world economy goes on decelerating. However, there will be no repetition of the oil crisis scenario seen in the 1970s. After all, the world cannot shy away from the price revolution. A far more important and efficient remedy would be structural policies aimed to induce saving of resource consumption rather than policies aimed to whip up aggregate demand. Crucial here is the insight into reforms on taxes and administrative regulations that can give a fillip to research and development.

The price revolution cannot be properly addressed by simply economizing on energy consumption. The government needs to take steps to enhance the efficiency of energy use and develop new energy sources and new materials through accelerated technological innovation. Japan is going through a paradigm shift pertaining to energy resources in quest for new business models and lifestyles that can save energy consumption. A corresponding paradigm shift is also needed with regard to policy responses and corporate management. **JS**

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