

# **Globalization, Oil Price Volatility, and the U.S. Economy**

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**Abstract:** The rise of economic globalization has made us more aware of world financial crises and their rapid transmission from one country to another, largely due to the accelerated speed of global communications. Regional financial crises such as those stemming from the European monetary grid breakdown in 1992, the currency devaluation in Mexico in 1995, the Asian recession beginning 1997, and the Russian default in 1998 have become more frequent and their domestic economic impacts have grown. While such crises can arise from fluctuations in foreign exchange and stock markets, economic instability can also result from volatility in world primary commodity markets. Of most recent importance have been the crude oil market crises including the Arab production embargo in 1973, the fall of the Shah of Iran in 1979, and the Iraqi invasion of Kuwait in 1990. Since 1999, OPEC has repeated its effort to cycle prices upwards. The previous oil price jumps led to higher energy prices and eventually to the severe recessions of 1975 and 1980-82 in the US. This paper attempts to examine the importance of commodity markets, to trace the influences of globalization on these markets, to focus on the crude oil market as a source of volatility including its impacts on the US economy, and to explore oil market stabilization possibilities that could reduce these impacts.

# **GLOBALIZATION, OIL PRICE VOLATILITY, AND THE US ECONOMY**

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The rise of economic globalization has made us more aware of world financial crises and their rapid transmission from one country to another, largely due to the accelerated speed of global communications. Regional financial crises such as those stemming from the European monetary grid breakdown in 1992, the currency devaluation in Mexico in 1995, the Asian recession beginning 1997, and the Russian default in 1998 have become more frequent and their domestic economic impacts have grown. While such crises can arise from fluctuations in foreign exchange and stock markets, economic instability can also result from volatility in world primary commodity markets. These markets not only display wide price fluctuations reflecting demand and supply disequilibria, they also support trading in futures and options whose prices fluctuate as much as stock prices. Of most recent importance have been the crude oil market crises including the Arab production embargo in 1973, the fall of the Shah of Iran in 1979, and the Iraqi invasion of Kuwait in 1990. Since 1999, OPEC has repeated its efforts to cycle prices upwards. The previous oil price jumps led to higher energy prices and eventually to the severe recessions of 1975 and 1980-82 in the US. This paper attempts to examine the importance of commodity markets, to trace the influences of globalization on these markets, to focus on the crude oil market as a source of volatility including its impacts on the US economy, and to explore stabilization possibilities for the future.

## **Importance of Commodity Markets**

What are commodity markets and why are they so important? Primary commodity markets provide for the exchange of natural resources that remain at a preliminary stage of processing. Altogether more than one-hundred primary commodities are exchanged internationally including agricultural food products (e.g., wheat, coffee, wine), agricultural raw materials (e.g., cotton, rubber, lumber), marine resources (e.g., lobster, shrimp, tuna), metals and minerals (e.g., copper, gold, diamonds), and fuels (e.g., crude oil and its products, coal, natural gas). These commodities are traded truly globally on

markets in locations such as Buenos Aires, Chicago, Calcutta, Kuala Lumpur, London, New York, Paris, Rotterdam, Singapore, Sydney and Tokyo.

Commodity markets also feature trading in derivatives such as futures and options contracts and thus possess a dimension similar to that of foreign exchange and stock markets. Futures trading involves the exchange of paper contracts that specify forward delivery accompanied by terms permitting easy transfer of liability. Techniques employed include hedging and speculation: Hedgers, for example, can sell contracts for commodities they have produced in order to insure themselves against the risk of a price decline; speculators can take opposite positions with the hope of making profits from a price change in an expected direction. Of course trading is much more complicated than this with foreign exchange coverage and spreads and other tactics pursued. One can also take delivery of a commodity at a contract's expiration date. Today futures trading extends to more than fifty commodities on more than forty exchanges. Examples of the latter include the Chicago Board of Trade, Chicago Mercantile Exchange, New York Commodity Exchange, London Metal Exchange, Paris MATIF, Sydney Futures Exchange, and the Tokyo Commodity Exchange. Crude oil futures trading takes place on the NY Mercantile Exchange and on the International Petroleum Exchange.

Our main interest is with the extent to which prices fluctuate on these various markets and exchanges. Why are primary commodity prices so volatile? For agricultural commodities whose demand is relatively constant (price-inelastic), fluctuations in production resulting from weather variations cause fluctuations in prices. For mineral and energy commodities where supply is relatively fixed (capacity is price inelastic in the short term), fluctuations in international business cycles tend to destabilize commodity demand and hence prices. Commodity market disequilibria as reflected in various forms of inventory holding and the time lags needed to adjust inventory and capacity also play a role. In the case of the crude oil market, policies designed to decrease or increase production or to allocate market shares can also induce price disturbances. For markets where futures exchanges also exist, excessive speculation (relative to actual production) can amplify any price swings already started. Underlying this view of "market fundamentals" is the assumption that traders have "rational expectations" and thus incorporate available information concerning these "fundamentals" in their decisions.

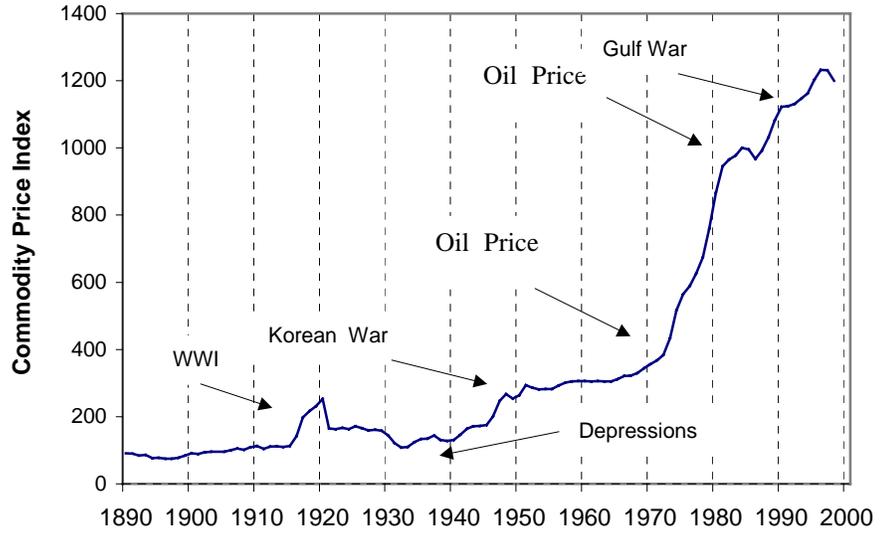
However, random information or noise often distorts such price formation, and price behavior will deviate from efficiency, often being cyclic or even chaotic.

Some idea of the volatility of these fluctuations can be viewed in Figure 1.A, which features an aggregated price index of primary commodities in the US. Commodity price levels are shown to rise slowly from 1890 until 1970, after which they increase almost exponentially. Price peaks can be identified in relation to the price inflations of World War I, the Korean war, and the OPEC oil price shocks. The price trough of the Great Depression is clearly evident. Other price peaks and troughs, however, are more difficult to decipher because of the strong trend in the data. By removing this trend, fluctuations in prices can be observed more clearly. This has been accomplished simply by computing the percentage price changes from year to year and plotting them in the corresponding Figure 1.B. One can now witness the turning points in the price cycles occurring about the time of WWI, WWII, the OPEC shocks of 1973 and 1979, and the recessions of 1980-82 and 1991. Also of importance is the frequent, wide and sometimes volatile nature of the price swings throughout almost a century of observation.

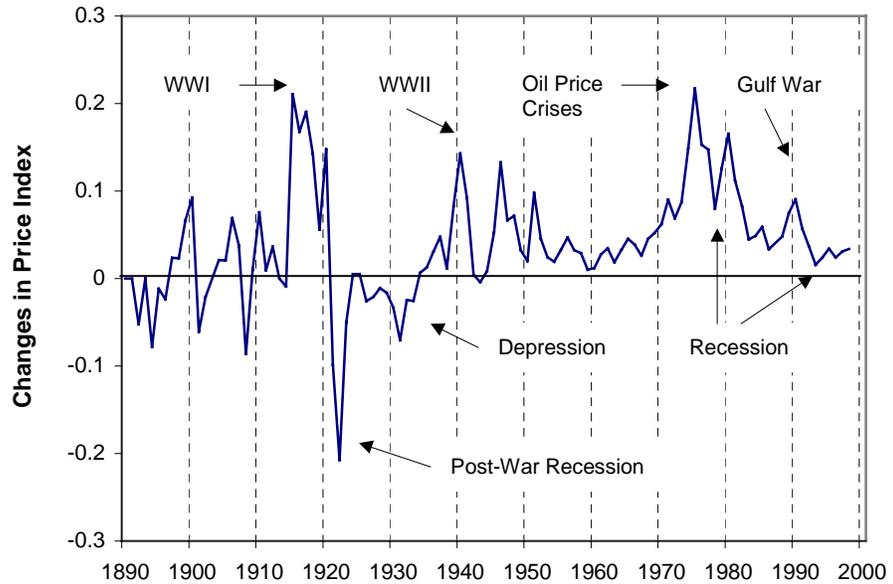
The significance of this volatility concerns its impacts. Commodity producers and consumers, whether they be individuals or vast multinational organizations, suffer from price fluctuations. For example, sudden high energy prices cause consumers to reduce purchases and to reallocate their budgets. Transportation becomes restrictive with gasoline prices rising and supplements added to normal passenger fares and freight rates. Elderly persons on fixed incomes can no longer afford normal heating bills. Manufacturers not capable of rapid energy substitution face costly disruptions in order to avoid final product price increases. When the latter occurs, we have the beginnings of inflation. Such price fluctuations can not only induce different stages of the business cycle concerning prosperity and recession in one single country such as the US, but they can also transmit business cycle upturns and downturns to other countries. Consider the case of small nations that are less able to save themselves from major economic downturns in the larger nations. If higher oil prices lead to inflation, recession will eventually begin in the larger nations; they will consequently buy fewer raw materials from the smaller nations, mainly the commodity-exporting countries. Consequently, commodity prices will begin to fall in the latter, and this will further lower their already

**Figure 1 COMMODITY PRICE FLUCTUATIONS**

**1.A  
COMMODITY  
PRICE INDEX**



**1.B  
CHANGES IN  
COMMODITY  
PRICE INDEX**



declining export revenues. The smaller nations, consequently, will buy fewer industrial goods from the larger nations and hence the industrial production and purchasing power of the latter will decline further. The oil price increases thus induce a multiplier effect as other large and small nations become involved; this downward economic spiral would continue until oil prices again fall and the seeds of recovery are sown. What OPEC fails to recognize is that commodity and hence oil markets are basically cyclical and whatever price upturns they set into motion will eventually lead to severe downturns. Their attempts to increase prices neglect the basics of natural resource price behavior which, if recognized, could lead them to optimize their returns over time without creating another global economic recession

### **Influences of Globalization**

What is globalization and how does it affect commodity markets? Globalization is not a unique force causing economic and cultural homogenization, but a diverse force reflecting different kinds of integration in different countries. Its definition thus depends on which cultural aspect we focus. Concerning the economic aspect, globalization centers on (1) industrialization and income convergence, (2) migration, employment and factor prices, (3) trade and investment, and (4) capital flows and markets. Our particular concern is with the recent financial crises that globalization has spawned and how these activities affect commodity trade and markets. To address this concern, we might want to consider whether today's globalization is a new phenomenon. That is, was it as extensive or even more extensive at some point in the past. A previous globalization wave occurred roughly between 1870 and 1914. This wave benefited from the then existing gold standard, a system of fixed exchange rates, and a network of fixed markets and institutions centered in London. As such, it reflected a degree of interdependence that has been approached only recently. In 1919 Keynes wrote: "What an extraordinary episode in the progress of man that age which came to an end in August 1914!...the inhabitant of London could order by telephone, sipping his morning tea in bed, the various products of the whole earth...he could at the same time and by the same means venture his wealth in the natural resources and new enterprises of any quarter of the world...he could secure forthwith, if he wished it, cheap and comfortable means of transit

to any country or climate without passport or other formality...”(Keynes, 1920 p11, quoted in Sachs and Warner 1995).

The current wave can be judged as occurring roughly between 1960 and the present. How can we compare the present wave of globalization to the latter? In the economic domain, the most important criteria are the extent of international capital flows, equality of savings and investment, financial market integration, and increases in merchandise trade flows. Capital flows reflect the mobility of capital in moving from one country to another. While some dispute rests in measuring these flows, they essentially are embodied in the current account balance of a country and how large the balances are relative to the national income or product of a country. (Current account equals the trade balance plus the balance on other goods, services, income and related minor transfers.) When we examine the current account to gross domestic product ratios in Table 1, it is surprising that the ratios for the period 1989-1996 are not much higher than for the period 1890-1913. In fact between 1919 and 1939 the well-integrated global economy disintegrated to being almost autarkic. Except for the US ratio, those shown for the UK, France and the major country average are noticeably smaller than their pre-WWI values. Ratios that reached 4.6 percent in 1890-1913 have only risen to 2.6 percent during 1989-1996. This is more surprising if we reflect that the era of floating exchange rates after 1970 reduced the need for capital controls.

While these capital flow ratios are impressive, they may overstate the degree of integration. Small flows are still important as long as returns to capital are equalized among countries; and large flows may reflect flow restrictions if these returns are less than equalized. To validate the above results, the equality between savings and investment should be analyzed. Theoretically a low correlation should exist between savings and investment in a country, if domestic savings must search beyond domestic investment opportunities to gain higher returns abroad. A higher correlation would imply smaller savings outflows. Table 1 reports the correlations between savings and investment for the same major countries, though the dating is slightly different. The low levels of correlation found for the earlier periods are surprising and suggest that the period 1890-1913 saw global capital market integration significantly greater than what is observed today.

**Table 1. GLOBALIZATION PATTERNS**

Country	Approximate Historical Periods <sup>a</sup>				
	c1870-1889	c1890-1913	c1919-1926	c1947-1959	c1985-1995
Current Account as Percent of GDP <sup>b</sup>					
U. S.	0.7	1.0	1.7	0.6	1.2
U. K.	4.6	4.6	2.7	1.2	2.6
France	2.4	1.3	2.8	1.5	0.7
Japan	0.6	2.4	2.1	1.3	2.1
Avr(12) <sup>c</sup>	3.0	3.2	4.0	2.3	2.5
Total Trade as Percent of GDP <sup>d</sup>					
U. S.	14	11	-	9	24
U. K.	41	44	-	30	57
France	33	35	-	23	43
Japan	10	30	-	19	17
Avr(11) <sup>e</sup>	33	39	-	33	51
Correlation Between Domestic Investment and Savings					
Avr(12) <sup>c</sup>	0.5	0.7	0.5	0.9	0.8

a. Data do not represent all years but approximate a period or circa (c)

b. A. Taylor (1996), "International Capital Mobility in History," NBER WP 5743, National Bureau of Economic Research, Cambridge

c. Average for twelve major countries

d. S. Kuznets (1965) *Economic Growth and Structure*, London: Heinemann; and P. E. Baldwin and P. E. Martin (1999), "Two Waves of Globalization," NBER WP 6904, National Bureau of Economic Research, Cambridge

e. Average for eleven major countries.

Changes in international trade also reflect the degree to which countries are integrated. The first wave of trade increases before 1900 was stimulated by technological innovations and infrastructure investment that greatly lowered transport costs. This worked to the disadvantage of developing nations that began to import rather than to export manufactures and thus became purveyors of primary commodities to the developed countries. This pattern has increased until only recently; recall the efforts of Secretary of State Henry Kissinger and the North-South commodity debates of the 1970s. Again the changing importance of trade can be witnessed by contrasting trade shares to gross domestic product, i.e. the greater the share, the more open the economy. Table 1 reports that the ratio of total trade (imports plus exports) to product rose during the first wave, declined because of war disruptions, and then recovered only recently. The major country average that reached 32 percent in 1890-1913 did not appear again until the 51 percent reached after 1985. This was in spite of the stimulation received during the Bretton-Woods era from 1945 to 1971, when government spending seemed to encourage trade flows in the attempt to rebuild the world economy. Concerning individual countries, Japan has yet to recover its openness, while the US has opened remarkably.

If the above data support the possibility that the earlier and present wave of globalization are similar in their degree of integration, in what respect is the present wave different from the first wave? Among differences in underlying factors, globalization advanced rapidly at the beginning of this century, because the then existing gold standard provided a stable system of fixed exchange rates. This stability encouraged capital to search the world for its highest return. In addition the mentioned technological advances permitted a reduction in transportation costs that stimulated the shipment and hence international trade in goods. Concerning the major factors underlying the second wave, the Bretton-Woods period began with a system of exchange rates which were not constant but pegged, permitting currency adjustments against the strong US dollar to be made from time to time. However, after 1972 the world moved closer to the present system of flexible exchange rates. The major technological impact in this era was the reduction in communication costs, reflected in lower telephone charges, increased use of facsimile transmissions, and expanding use of the internet. This transition from trade in goods to trade in ideas also facilitated capital transactions and flows between countries.

Also important is the change in US dependence on foreign energy imports. In 1910 the US was energy independent, but since 1992 our imports of crude oil have risen so sharply that they constitute more than one-half of total oil consumption.

How has this new wave of globalization affected the volatility of commodity markets? Concerning the proportion of primary commodities in world trade, the ratio has declined slightly from approximately 45 percent during 1960-70 to 31 percent between 1992-98. Much of this decline can be explained by the relative increase of manufactures in total goods trade, an inevitable result of the higher technological content of the goods traded and of increasing world industrialization. As would be expected, the international exchange or trade in these commodities has grown considerably. Table 2 indicates that the real value of commodity trade increased some 1.57 times between 1960-70 and 1971-75 (trade value index fixed at 100 in the base period of 1960-70 rising to 157 in 1971-75). More recent increases taken relative to the base period are 2.60 times by 1985-91 and 4.23 times by 1992-98. Figure 2 emphasizes that commodity trade is now four times higher than in the 1960s. As substantial as this increase seems, the reduction in communication costs leading the second wave seems to have spawned much greater trade in paper such as financial and commodity derivatives. If we consider the growth in the average volume of futures contracts traded in the US since 1960-70, the volume increased 2.9 times by 1971-75, 11.2 times by 1976-84, 28.9 times by 1985-91 and 49.9 times by 1992-98 (54.2 times by 1995-98). Figure 2 again demonstrates the exponential nature of this growth. Unfortunately the lack of data prevent us from estimating the additional futures trading growth that has occurred on other new and existing exchanges worldwide, particularly the growth of trading on emerging markets in developing countries.

Our conclusion at this point must be that the present wave of globalization has increased commodity trading activity immensely and that this global activity is intertwined with movements of capital, financial transactions and economic growth. When considering the behavior OPEC, higher crude oil prices not only hold other nations hostage but also destabilize short term investment flows.

**Table 2. COMMODITY MARKET IMPLICATIONS**

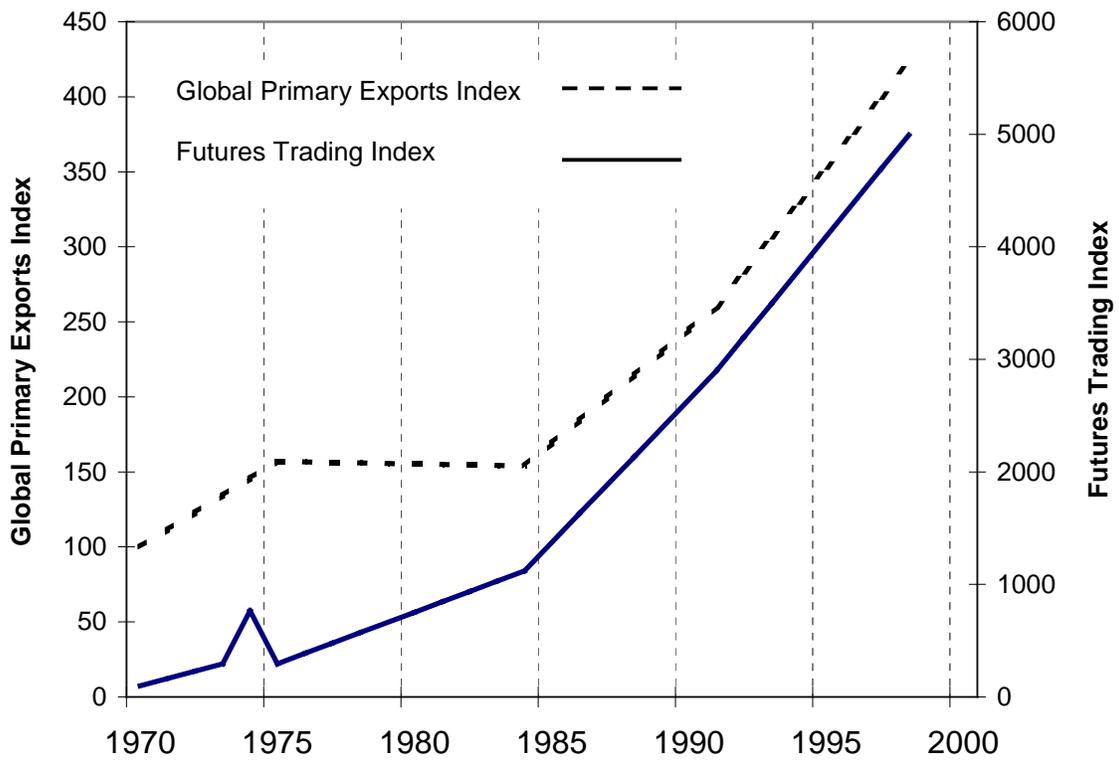
Variable	1960-1970	1971-1975	1976-1984	1985-1991	1992-1998
Growth in Commodity Activity <sup>a</sup>					
Global Exports	100	157	154	260	423
Futures Trading	100	295	1,120	2,897	4,994
Primary/Total	0.45	0.42	0.39	0.36	0.31
Variation in Commodity Prices <sup>b</sup>					
UNCTAD Index	3.40	11.54	6.56	4.23	3.84
Crude Oil	-	30.07	10.65	20.06	9.74
Gold	31.06	15.24	12.86	5.90	13.00
Wheat	3.80	17.12	6.85	8.37	9.81
Variation in US Business Cycles <sup>c</sup>					
Consumer Prices	0.85	1.85	2.01	1.05	0.66
Producer Prices	0.74	3.55	2.07	1.21	0.84
Gross Product	1.81	2.60	2.65	1.56	1.37
Unemployment	13.09	13.68	9.41	8.25	10.14
Interest Rate	4.76	14.64	14.58	6.19	5.27
Money Supply	2.76	3.03	3.23	3.27	2.37
Stock Prices	5.94	7.89	5.75	7.30	5.11
Exchange Rates	-	2.80	2.39	3.19	2.46

a. Index based on 1960-70=100. Global primary commodity real export values; US futures contract trading volumes. Data compiled by author

b,c. Standard deviation of variable percent changes. Prices from UNCTAD Commodity Price Bulletin.

c. Variable definitions available from the author. Data from US Department of Commerce files.

**Figure 2 IMPACTS OF GLOBALIZATION ON COMMODITY MARKETS**



## **Linkages between Markets and the US Economy**

What can we say about how commodity market volatility might affect the US economy? Let us first observe this relation in the context of general market and business cycle activity and then take an individual commodity perspective.

### **Nature of Commodity Linkages**

To evaluate the possible impact of commodity globalization on the US economy, we should attempt to assess its impacts on commodity prices as well as on price-linked business cycles. The most direct link often cited is that commodity price increases can lead to periods of inflation, the latter reflected in changes in the producer and consumer price indexes. For manufactures and processors, higher commodity prices lead to lower corporate profits, higher unemployment and result in less consumer spending. In an overheated economy, increased futures trading activity on the part of speculators can amplify already rising commodity prices. Related to this phenomenon is the influence of commodity prices on the cost of living and subsequently on wages and employment. Particularly crude oil prices have shown a strong relation to unemployment in the US as well as in other OECD countries. Ultimately increased unemployment reduces demand, causing gross national product to fall and creates even more unemployment.

Concerning monetary linkages in the US economy, commodity prices can affect interest rates through inflation; not-surprisingly these interest rates can affect commodity markets in return. Higher interest rates can reduce our ability to hold commodity inventories and to continue proposed investments in production facilities such as new mines. There also is an important relation between commodity spot and futures prices and inventory holding. At the external level, foreign exchange earnings, particularly from agricultural commodities, will decline with falling prices. There will be a reduced flow-of-funds with other countries. This earnings effect will also pass to countries that import from the US, mainly because their exchange rate fluctuations will influence the value of their trade in commodities that are US dollar denominated.

A final linkage comes from the extent to which the US economy relies on the imports of primary commodities such as crude oil to sustain its own production, consumption and services. Commodity price swings are thus important for industries with higher commodity import requirements per unit of output. In recent decades the US has become

more dependent on the imports of minerals and metals, because of the depletion of our low-cost mining deposits and because of the effects of environmental regulations in reducing domestic mineral processing as well. With respect to crude oil and other energy imports, the US not only depends critically on these imports but also ranks high among countries in its use of energy inputs per unit of output. Imports of crude oil have risen from about 37 percent of consumption in 1980 to more than 50 percent of consumption today.

Let us now evaluate some of these linkages empirically by examining the variability of business cycles in the US economy relative to commodity price variability. Table 2 provides comparisons of this variability (standard deviations of percentage changes in the indexes) over the major (commonly recognized) business cycle swings since 1960. Commodity price behavior known to be unstable reflects considerable but not rising variability over the total period, except for the sub-period corresponding to the energy crises of the 1970s. Variability of the macroeconomic indicators measuring the business cycles also has not grown over time but again for the increase appearing in the 1970s. Certainly this relative instability together with the severe recessions of 1975 and of 1980-82 demonstrate the severe shocks that oil price volatility can have on the US economy.

Outside of the sub-period, the variability of the UNCTAD commodity price index has held at 3-4 percent, while that of wheat and crude oil prices has held at about 10 percent. Only the gold price continues to experience a notable degree of volatility. At the same time, fluctuations in the US economy have not outpaced those of commodity prices. Table 2 reports the variability of certain macroeconomic variables that reflect changes in business cycle activity in our economy. Changes in inflation reflected in consumer (latest 0.6%) and producer (0.9%) prices have not returned to the variability surrounding the oil price changes of the 1970s. Fluctuations in gross national product (1.3%) and in the rate of unemployment (10.0%) also have held relatively constant. Concerning monetary linkages, interest rates (3.1%) and the money supply (1.6%-M1) have not been affected either. Although stock market prices have risen considerably following the crash of 1987, their variability (6.2%) has not risen above that experienced in the 1970s. Finally the termination of the Bretton-Woods agreement concerning exchange rates in 1973 also has not caused the effective exchange rate (2.9%) to vary more widely.

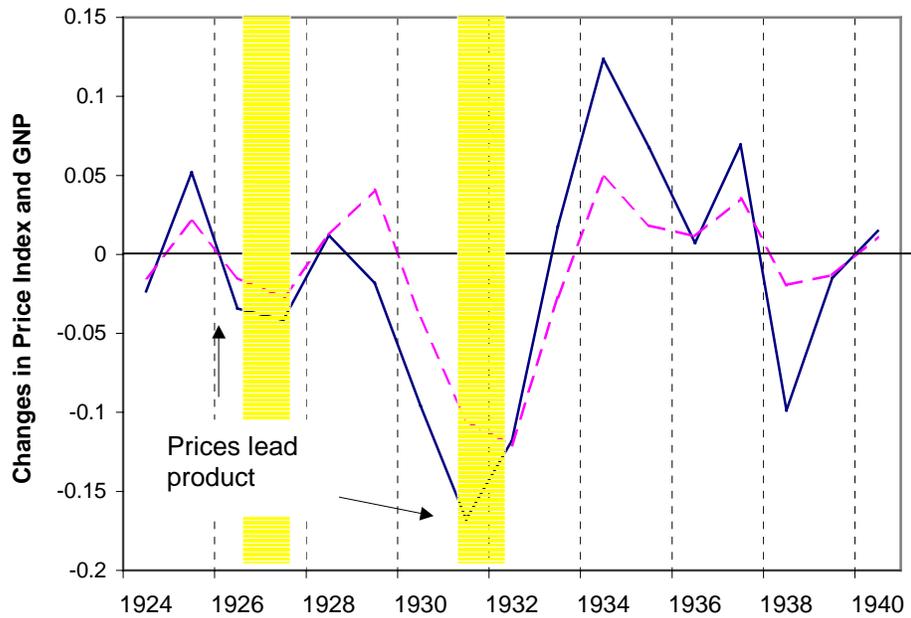
## **Individual Commodity Linkages**

Since the above results suggest that the impacts of commodity market volatility are more severe during the time of individual commodity crises, let us examine such linkages in greater detail. It is rather well known that individual commodities have impacted on national economies for some time. Grain prices, for example, have proven important not only for politico-economic stability in ancient Egypt and Latin Rome, but also in medieval Europe and in modern America. The historical importance of commodity prices in the US stemmed from the dominance of agricultural and other raw material commodities in total merchandise production. In the early part of this century, economists attempted to find a relation between business cycles and fluctuations in crop yields or in the output of livestock and animal products. For example, the effects of a good harvest could possibly cause a fall in investment by agricultural producers, a rise in investment by the related transport industries, a rise in investment by consumer goods industries, and a change in the amount of investment in holding stocks of agricultural produce. The reverse effect is not believed to be as strong, since fluctuations in national income and industrial production were not thought to cause changes in agricultural output, because of the relative inelasticity of agricultural supply.

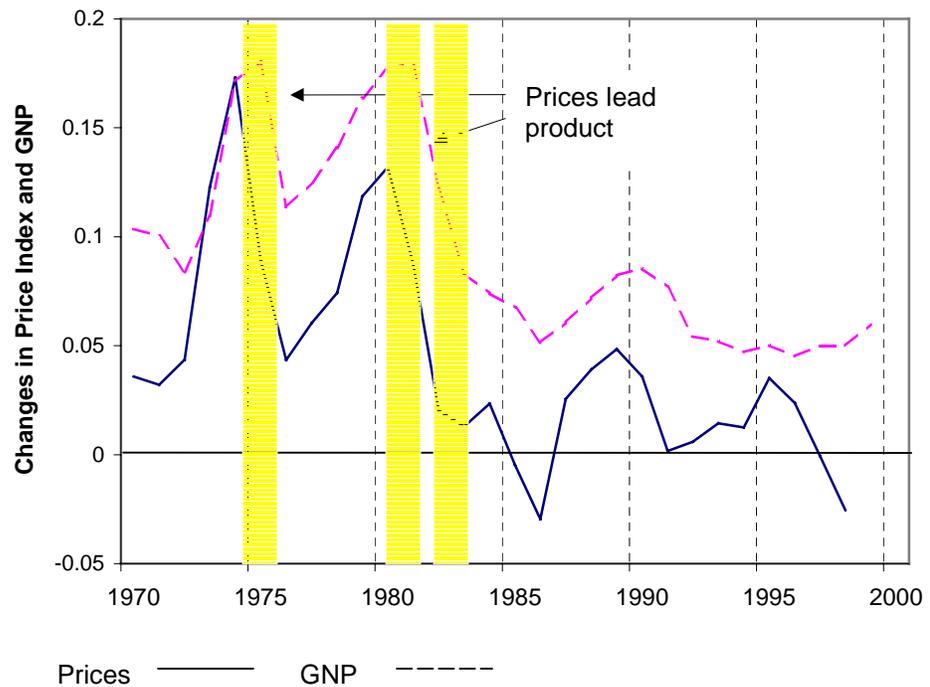
As our nation approached mid-century though, the relationship between agricultural, mineral, and energy commodities and industrial production became more complex. W. Arthur Lewis develops this view in his attempt to decipher the causes of the Great Depression. Beginning in 1925, technological innovations in agricultural and mining increased output productivity to the point where commodity prices began to decline. This did not occur immediately in the United States, but by 1929 the stock market crash amplified existing price downturns. From 1929 to 1930, the prices of wheat fell by 19 percent, wool 46 percent, rubber 48 percent, copper 26 percent and tin 29 percent. From 1929 to 1932 the US commodity price index fell 32 percent. Lewis suggested that the price declines preceded if not induced changes in our national production, an observation later confirmed by Kindleberger. Figure 3.A demonstrates this relation, showing how changes in the commodity price index led changes in gross national product, first with the peak in 1928, then at the trough in 1931, and also coincided with the peak in 1934. While the price effect was itself substantial, it was intertwined with problems of declining

**Figure 3 COMMODITY PRICES AND NATIONAL PRODUCT IN THE UNITED STATES**

3.A  
CHANGES IN  
COMMODITY  
PRICE INDEX  
AND GROSS  
NATIONAL  
PRODUCT,  
1925-1940



3.B  
CHANGES IN  
COMMODITY  
PRICE INDEX  
AND GROSS  
NATIONAL  
PRODUCT,  
1970-1998



investments, contractions of trade and a series of monetary crises. This combination checked confidence in recovery and these fluctuations were transmitted worldwide.

What has happened to this linkage between commodity markets and industrial production during the second wave of globalization? The most crucial phase occurred between 1973 and 1981. The crude oil producers' association, better known as OPEC, quadrupled crude oil prices between 1973 and 1974, and then tripled them between 1979 and 1981. Because the major countries associated these phenomena with other forms of resource scarcity, commodity prices rose accordingly. Between 1972 and 1974, the aggregate commodity price index rose by some 50 percent. By 1980, however, higher oil prices had induced greater oil exploration and production. Oil prices and other commodity prices thus began to decline and the world economy slipped into the recession of 1980-82 that was the deepest since the 1930's. Part B of Figure 3 illustrates how the downturn in commodity prices beginning in 1974 preceded the downturn in GNP in 1976. This price lead was repeated in 1981, when the decline in commodity prices anticipated the slide in GNP.

### **Oil Price Linkages**

Let us now explore the mentioned crude oil price linkages in greater detail. While some ambiguity exists among economists as to the magnitude of these linkages, the possibilities of oil price impacts are clear. First, it has been mentioned that higher oil prices can lead to higher inflation, lower corporate profits, higher unemployment and reduced national economic growth. Second, higher oil price volatility can lead to a reduction in investment, leading in turn to a long term reduction in supply, higher prices, and potentially to reduced macroeconomic activity. And third, increasing volatility can impose economic disruption costs and higher transactions costs on consumers and producers, adding to inflation, or cutting rates of growth, or both.

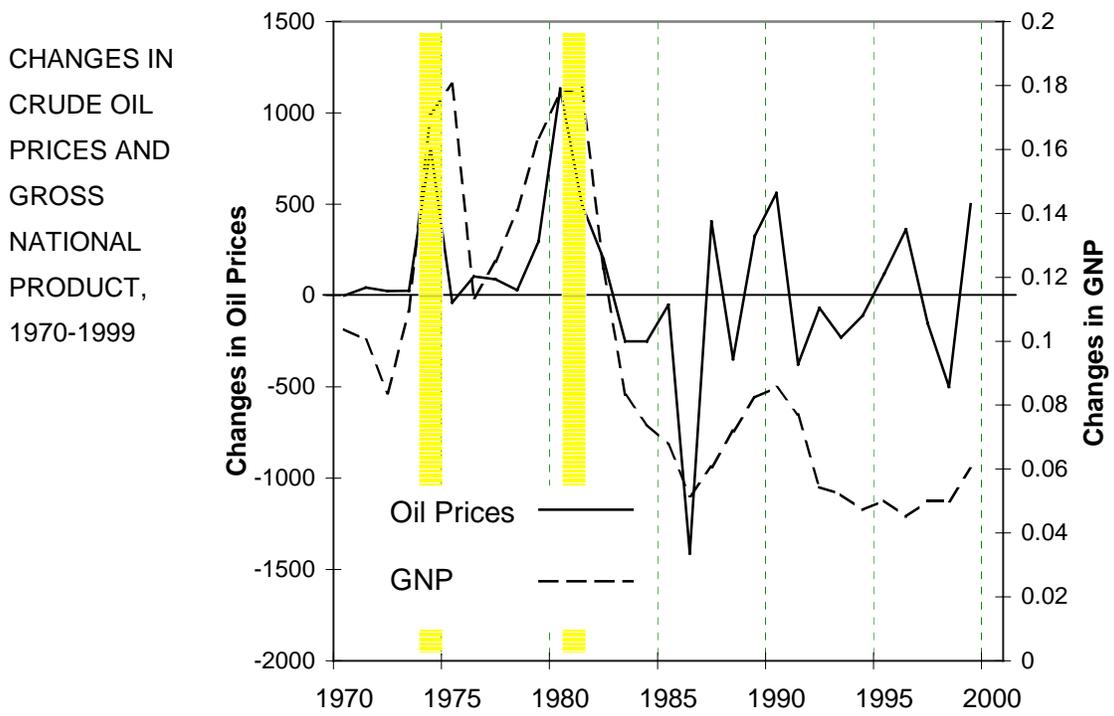
The first oil shock the world felt was in October 1973 when OPEC increased oil prices (benchmark Saudi Light) from \$2.59 per barrel in September of 1973 to \$11.56 by March of 1974. This increase was reinforced by an Arab oil embargo against the US and the Netherlands and more importantly, OPEC's gradual reduction of oil production as well. Prices thus continued to move gradually upwards, but a jump again occurred because of several timely events. The Iranian revolution beginning in 1979 resulted in a

considerable loss of that country's production and exports. By 1980 Iraq had entered into war with Iran, causing the oil production of both countries to falter. Because OPEC wanted to keep oil prices high, they made no attempt to increase production in face of this crisis. Crude oil prices thus almost tripled from \$13 per barrel in 1978 to \$34 in 1981. (The historical prices referred to are in nominal rather than real terms, because our interest is in price volatility rather than in price levels.) This price shock was even more severe on the global economy and on oil demand than the first, because of its magnitude and duration. Energy conservation efforts and fuel substitution subsequently caused oil demand to decline sharply. Even in developing countries with initially low oil requirements, demand also declined.

Worldwide the inflation induced by the high oil prices finally brought a decline in national economic growth; a severe recession began in the US that then spread to other nations, as the multiplier effects of the trade declines between North and South took hold. As shown in Figure 4, these crude oil price changes appear to have led changes in US national product. Crude oil price changes have led peaks in GNP in 1974, 1981 and 1991, and led troughs in 1976, 1982 and 1992. By 1980 the higher oil prices stimulated more investment in exploration and this led to higher production in non-OPEC countries. This production was made increasingly available by moving its sales from long term contracts to spot trading. During this time, Saudi Arabia kept reducing its production to help maintain OPEC's price goals. The disagreements within OPEC fueled by the Iran-Iraqi war and Saudi-Iranian friction had prevented the recovery of previous quota discipline. Finally in 1985 Saudi Arabia increased its production mainly because of falling OPEC market shares, but this maneuver caused prices to tumble from \$28 per barrel (now Dubai) in 1985 to \$13 in 1986. This time OPEC members did not stem production but increased it to offset falling revenues. Evidently OPEC decided to shift emphasis from price defense to market share defense.

At the beginning of the 1990s, OPEC attempted to strike at the West again. This time the oil price jump was provoked by Iraq's invasion of Kuwait in August of 1990 and the start of the Gulf war. This rise in oil prices, however, was short-lived. Prices rose from \$13 per barrel in June 1990 to \$32 in October and then fell back to \$14 by February 1991, roughly the pre-crisis level. Most OPEC countries decided to increase their output

**Figure 4 INDIVIDUAL COMMODITIES AND THE US ECONOMY**



to maintain the needed supplies to complete the war. Other economic crises also occurred at that time. The collapse of the Berlin wall led to economic declines in Eastern Europe and, in particular, in the former Soviet Union. These countries were large participants in international trade in commodities, both as importers (particularly of grains) and as exporters (particularly of metals). Their demand for imported commodities fell concomitantly with the fall in output and aggregate demand that followed the collapse of the centrally planned economic systems. Short of hard currencies, these countries then began to dump commodity exports on world markets. Prices thus continued to fall until late in 1992. Only economic growth in the United States seemed to have stalled what could have been another world recession.

Commodity prices then reversed themselves; between 1993 and 1995 the commodity price index rose by 19.4 percent. But these gains were very short lived as economic crises emerged in Japan and Brazil. East Asian countries that are large importers of raw materials bought less as the Japanese economy collapsed, causing their economies to enter a severe slump. The earlier higher prices had led to increased production capacity and hence to ample supplies and swollen inventories, and these were plagued by the resulting weak demands. The commodity price cycle began to repeat itself again. The prices of major commodity groups started to decline in mid-1997 and continued to fall through 1998, among the largest movements being that of crude oil. Unfortunately OPEC increased its quotas at the same time that Asia suddenly entered a strong recession. Prices fell from \$19 to \$12 (Arabian light) per barrel at the end of 1998, the lowest price reached at any time in recent years. Gold prices also fell from \$295 per ounce in September 1998 to \$256 in July 1999. Economic growth worldwide until recently had been slow.

Will commodity market volatility again lead the US economy to the severity of the recessions experienced in the 1930s and the early 1980s? It is alarming to find that crude oil prices have begun to rise again. Alarmed by the apparent plunge in crude oil prices in mid-1999, OPEC instigated a reduction in production quotas. Initiated by Saudi Arabia and supported by Mexico as well as the new regime in Venezuela, this decision has been supported by quota discipline among other OPEC members. Unfortunately the decision was not well timed, since it coincided with the recovery of the Asian economies and

increased oil demand growth. Crude oil prices again jumped from \$12 in January 1999 to \$29 in March 2000. Stocks of crude oil began falling in the end of 1999 to prevent sharper crude and refined price rises, as refining margins declined. OECD stocks thus fell to their lowest levels since the end of 1996. In the case of the US, crude oil and refined stocks have fallen to their lowest levels in recent years; crude oil stocks at the end of 1999 were 284 million barrels and the strategic petroleum reserve was 569 million barrels, also alarmingly low. Given that US consumption averaged 14.8 million barrels per day and that US imports averaged 8.6 million barrels per day in December 1999, this means that the strategic reserve constitutes only 38.4 days of consumption or 66.0 days of imports. To prevent further price hikes, OPEC will have to begin increasing production quotas in fact as well as in declaration. Unfortunately the increases that have began among non-OPEC producers have been insufficient to turn the tide of prices. (Mostly a result of the neglect of oil companies not to bring on-line the substantial oil reserves of the non-OPEC countries).

The world has thus reached a plateau in which prices are elevated and stock levels are low; further price increases will only fire inflation further, causing economic growth to stagnate. We await the onset of another oil-induced economic recession. While some experts believe that OPEC will not raise prices further because resulting higher consumer prices and inflation could stimulate another recession, other experts fear that OPEC still does not understand the dynamics of these price linkages. They believe that OPEC's plan to manage the first-ever "soft-landing" for oil prices is hampered by poor and often delayed information about world oil markets, the unpredictable responses of traders to expectations, and unity among typically discordant producers. Sometimes it is difficult to predict how prices might change, since price decisions in OPEC are often made to accommodate internal battles over market share. To some extent their plan already is a failure, because in March 2000 the oil price was \$5 above the producers' new target of \$25 a barrel.

Returning to Figure 4, we can see the crude oil price changes beginning in 1999, possibly leading to higher consumer prices and interest rates and a downturn in national product. Published estimates suggest that if oil prices remain at \$30 this year, this might add 0.5-1.0 percentage points to our CPI inflation rate and reduce the GDP growth rate

by more than 0.5 percentage points. While some comfort may stem from the fact that the value of crude oil consumed in the US fell from 5.5 percent of GNP in 1980 to about 0.8 percent in 1999, this percentage will bounce back if oil prices remain high. Such pessimism is reflected in a recent New York Times article: “The price of crude oil is now \$29 per barrel, the highest since the run-up of the Persian Gulf war in 1991. This price jump is now spilling over into financial markets. Concerns about oil’s impact on inflation have sent bond prices lower and yields higher. *And*, if OPEC does not relent, the relatively low levels of oil inventories and strong demand mean that prices will move *even* higher.” (New York Times, 1/21/2000). In the case of other countries, the OECD has estimated that the last \$10 per barrel increase in oil prices, if sustained, would increase inflation in the principal economies by adding 0.5 percent, and would lower their GDP growth rate by 0.25 percentage points.

Other commodity prices have begun to follow oil prices upwards. Gold prices have risen to near \$290 on the agreement by European central banks to limit gold sales during the next five years. Other metal prices also have increased slightly because of the continued performance of the US economy and the recovery of the Asian economies. Agricultural prices with one or two exceptions have begun to rise slowly.

### **Where Do We Go From Here?**

Why has global financial and commodity trading grown at such an explosive pace? Do such global markets limit our Government in the pursuit of legitimate economic and social objectives? Can we prevent the destabilizing disturbances that originate in world commodity and asset markets or alternatively can we mitigate their effects? Though business cycle fluctuations have been relatively stable in the post-war period, we have seen how two major recessions have been associated with commodity price volatility. Our Government’s choice in dealing with these problems would appear to lie somewhere between supporting stabilization initiatives of international organizations and promoting new informal means of international governance.

Concerning the first of these, while “Commod” was proposed along with the World Bank, the World Trade Organization and the International Monetary Fund at Bretton-Woods, this commodity stabilization organization never came to fruition. Since then, neither buffer stock nor compensatory finance mechanisms have functioned successfully

under the guise of international commodity agreements (ICAs). Though the share of primary commodities in world trade has diminished, globalization has seen a greater frequency of regional financial and commodity crises, whose domestic economic impacts are becoming more difficult to counter.

With respect to new forms of international governance, many suggestions have been made as to how to reduce the risks of price volatility. These include making further use of commodity market-based hedging instruments, adopting prudent monetary and fiscal policies of a counter-cyclical nature, reducing capital account controls, and filling financial gaps where deficits occur. However, many experts envision that it might be difficult for such policies to work in unison across countries.

Finally there is the problem of what can be done to deal with the specific kinds of economic instability that can rise from price volatility in a single commodity such as crude oil. Western countries were initially not able to react effectively against OPEC and the oil price jumps of the 1970s. More recently the major petroleum companies do not seem to want to turn to non-OPEC oil for their supplies. As the US security stockpile diminishes, should these companies be asked to seek more secure supplies before they can draw from the stockpile? Should some international policy action be taken to ensure that the present excess profits gained by the petroleum multinationals be converted into investments that would assure the flow of non-OPEC oil supplies? Should this policy be put into the form of an international petroleum agreement (ICA) that improves market efficiency, upgrades institutions dealing with this market, and includes environmental considerations? There is an immediate need for production capacity building, restoring security oil stocks and developing energy substitution technologies. What must be done to awaken the international community to recognize the irresponsibility of OPEC's members and the need for improved energy efficiency and conservation?

In the case of US policy making, the Government has proposed several energy plans but each has failed to make significant changes in the energy economy. These involved President Nixon's Project independence, President Carter's National Energy Plan, and President Bush's National Energy Strategy. Like these, the current proposals in Congress are too weak. They include: allowing companies to borrow from the strategic oil reserve, suspending diesel fuel and additional gasoline taxes, opening federal lands for further oil

exploration, repealing the moratorium on off-shore drilling, imposing sanctions on countries that restrict oil production, and requiring renewable energy sources to be one-fifth of total energy consumption. These proposals are so far from what this country must do, that they reflect the degradation that comes to energy policy when it becomes a political or a campaign issue. What the US must do is very straightforward: (1) The Government must confront OPEC that it avoid market manipulation; OPEC's members are primarily of nations that we have actively supported in international conflicts. Membership in the "Global Club" requires that each nation gives and takes in return, enjoying the good fight but always allowing others to survive. (2) US based petroleum conglomerates that enjoy the benefits of being here should take the "Energy Pledge of Allegiance;" this means that they should be ensuring that our supplies come also from fringe or non-OPEC countries like Mexico and Canada, which after all are part of NAFTA, as well as Norway and England. (3) There is no reason why a domestic oil price control could not be established at a high enough level that would permit the enacting of long-term oil production and export contracts with non-OPEC countries. Considerable oil reserves still await discovery outside of the OPEC countries. (4) Urban and national rail networks should be expanded to increase use of the most energy efficient forms of transportation. This would also reduce congestion at the nation's airports. And (5) the petroleum strategic reserve should be expanded so that it provides at least one year's consumption. Accountants might not like the latter, but world conflicts are seldom so short lived. We really have to ask ourselves: why must we always be chasing our tails when it comes to solving energy problems and their economic disruptions?

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