

# The anatomy of three commodity booms

Marian Radetzki

*Lulea University of Technology, 97187 Lulea, Sweden*

Received 9 February 2006; received in revised form 31 May 2006; accepted 7 June 2006

## Abstract

Three major commodity booms since the second world war are identified and analyzed. In all three, demand shocks predominated as triggers to the commodity price rises. The first boom, in 1950–51, was caused by the massive inventory buildup in response to the Korean war. The second, in 1973–74, was accentuated by widespread harvest failures and by OPEC's market management, which tripled the price of oil. The third boom started in 2004 and has not yet run its course. This time, the explosive growth of China's and India's raw materials demand has played a key role. The first two booms collapsed as the world economy went into recession and excessive inventories were sold out. The third boom may prove more durable since the world economy continues to expand briskly and commodity inventories have remained small.

© 2006 Elsevier Ltd. All rights reserved.

*Keywords:* Commodity booms; Commodity prices; Demand shocks

## Overview and method

The purpose of the present paper is to study and compare the nature of the three most dramatic price booms in international commodity markets since the second world war. The first of the three events to be explored began in 1950, when price quotations exploded and remained at high levels during the two following years. The second one occurred in 1973, but prices fell back sharply already in 1975. The third boom event is still going on as this is being written (June, 2006), after the forceful price rises of 2004.

An overview of commodity price developments since 1948 is provided in Fig. 1. Several comments are in place.

The data in the figure are presented in the form of indices of annual prices in constant US dollars, with the year 2000 = 100. Three indices are depicted, viz. (a) all non-fuel commodities; (b) metals and minerals<sup>1</sup>; and (c) oil. The all non-fuel commodity index comprises (i) all edibles (food); (ii) agricultural raw materials; and (iii) metals and minerals. Though metals and minerals are included in all non-fuel commodities, I show that index separately to depict the

very strong performance of metals and minerals during the current boom. Oil prices comprise a basket of different qualities in proportions that represent imports into the OECD. The weights of the respective commodity groups are based on their values in international trade. The 1990 weights appear in Fig. 2 below (IMF Commodity statistics, IMF's home page on the web). These numbers should be taken as no more than rough indicators. They have obviously changed over the long period covered by Fig. 1.

Fig. 1 depicts prices in constant (2000) US dollars. Throughout the paper, constant dollar prices have been obtained by deflating the nominal prices using UN's Unit Value Index of US dollar prices for manufactured exports from industrialized countries (MUV Index). This index provides the size of the basket of manufactured goods exported from the rich world that could be obtained for one US dollar at different times. This index overcomes the problems of exchange rate changes not immediately reflected in the export prices that would arise with the use of a national price index such as that of US wholesale prices or the US GDP deflator. Since the MUV Index relates to manufactures only, it provides an appropriate counterpoint for measuring the price changes of raw materials, in focus of the present study. Early in the period covered by Fig. 1, the index was often referred to as an

*E-mail address:* [radetzki@chello.se](mailto:radetzki@chello.se).

<sup>1</sup>For the sake of brevity, in what follows this commodity group is sometimes referred to simply as "metals".

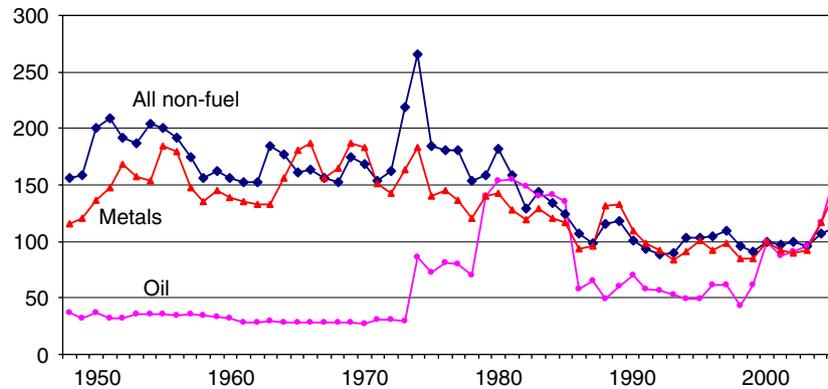


Fig. 1. Commodity price indices in constant US\$. 2000 = 100.

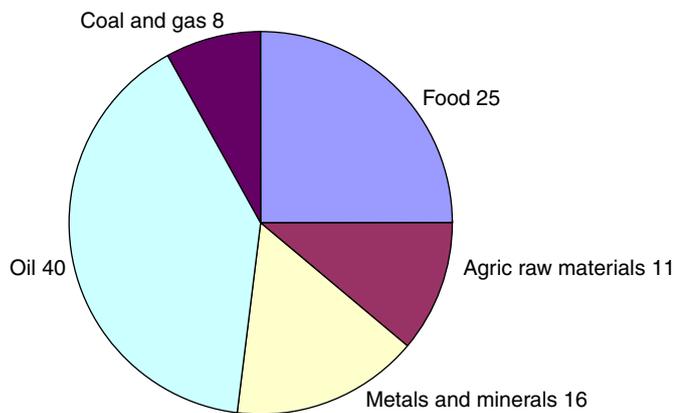


Fig. 2. The commodity index. Weights of commodity groups in the 1990s, percent.

“index of international inflation”. In more recent times it has become less representative of global inflation trends, since it does not cover the increasingly important manufactured exports from non-OECD countries, nor the sharply expanding trade in services.

The booms to be studied have been identified both by the strength and the generality of the upward price moves, and they stand out clearly in the graphs of Fig. 1. Nevertheless, as will be clear from the following discussion, some commodities recorded only limited price increases during some of the booms.

Fig. 1 additionally demonstrates the declining secular price trend (in constant dollars) for the aggregate of non-fuel commodities as well as metals indices, all comprising materials typically traded under competitive conditions, and the rising price trend for oil since the early 1970s, a period during which the oil market has been dominated by the monopolistic actions of the OPEC cartel.<sup>2</sup>

<sup>2</sup>However, it has been contended that commonly used price deflators (including the MUV index) exaggerate the true rate of inflation, primarily by ignoring quality improvements in manufactures (Svedberg and Tilton, 2006). Correcting for this contention would yield a stronger constant dollar commodity price development than shown in Fig. 1.

While the graphs in Fig. 1 consist of annual observations, the analyses of commodity price changes that follow provide greater detail both by looking at quarterly data, and in terms of commodity groups. The primary source of these graphs is the statistical material compiled in UNCTADs (2006) monthly *Commodity Price Bulletin* supplemented by Radetzki (1974) and World Bank statistical material for the first boom period. Each boom is illustrated by six graphs providing price data over a 4-year period (1949–52; 1972–75; and 2002–05), that comprise the price peak. The graphs on the left depict price movements in nominal dollars, first for an aggregate of all commodities, and then separately for food; agricultural raw materials; metals and minerals; and energy, respectively. The same numbers are reproduced on the right-hand side in constant dollars, using the MUV index as deflator. The focus of my discussion is on the constant price changes.

All indices are set at 100 for the first of the 4 years shown. Note that the scales differ, so a comparison between the graphs requires some care. Furthermore, so as to amplify the visual impression of the price changes, all the scales begin at 50.<sup>3</sup>

### The macroeconomic contexts of the booms

Table 1 details some macroeconomic data over the 4-year periods during which the commodity booms occurred. As noted, the inflation numbers reflect the changes in the US dollar prices for manufactured exports from the rich world. Because of lack of reliable and coherent statistics, my measures of the growth of GDP and of industrial production during the first and second booms relate to the OECD region (or to its predecessor OEEC) whose economy at those times accounted for no less than two-thirds of the world. For the most recent boom, I have additionally detailed developing Asia, thus assuring a coverage of some three quarters of the world totals. For

<sup>3</sup>The tables containing the numerical values underlying all the graphs contained in this paper can be obtained from radetzki@chello.se.

Table 1  
Growth and inflation patterns during three booms (percent)

	1949	1950	1951	1952
<i>North America and Western Europe</i>				
GDP	2.6	9.2	7.2	2.1
Industrial production	−0.3	8.1	9.3	3.2
International inflation, US\$	−3.5	−12.1	15.2	4.9
	1972	1973	1974	1975
<i>OECD</i>				
GDP	5.4	6.0	0.8	−0.2
Industrial production	6.5	8.1	−1.5	−4.3
International inflation, US\$	8.3	17.9	21.7	12.5
	2002	2003	2004	2005
<i>World</i>				
GDP	3.1	4.1	5.3	4.8
Industrial production	0.4	3.4	6.3	4.0
<i>OECD</i>				
GDP	1.6	2.0	3.3	2.7
Industrial production	0.1	1.1	4.1	1.9
International inflation, US\$	0	9.2	7.5	4.3
<i>Developing Asia</i>				
GDP	7.0	8.4	8.8	8.6
Industrial production	6.3	6.8	10.2	9.1

Notes: OECD represented 68% of world GDP in 1973. Source: UNCTAD Handbook, 1976.

OECD represented 52% of world GDP in 2005, while Developing Asia represented 27%, both in PPP terms. Source: IMF, *World Economic Outlook*, April 2006.

The 2005 numbers contain an element of forecast.

Sources: IMF, *World Economic Outlook*, April 2006; *Monthly Statistical Bulletin of the United Nations*; OECD Historical Statistics; OECD Main Economic Indicators; Radetzki (1974).

completeness, global growth numbers are also given for the third boom period.

It is a noteworthy observation that the growth of GDP and industrial production accelerated strongly in the periods just preceding or marking the beginning of the three commodity booms. It is equally interesting to note that the end of the first and second booms characterized by substantial falls in commodity prices in 1952 and 1974, coincided with a sharp weakening in the growth of GDP and industrial production. I will revert to this observation in the final section of the paper. It remains to be seen whether a similar coincidence will mark the end of the third boom.

In contrast to the above uniformity, the booms occurred in periods with highly contrasting inflation performance. The inflationary evidence is reviewed below for each boom in turn.

### The first commodity boom

This boom was clearly and strongly related to the Korea war, which broke out in June 1950, with an armistice reached in July 1953. The impact of the war on commodity markets was both direct and indirect. The *direct* impact

arose from the insecurity felt about industrial materials supply, amplified by the painful experiences of the second world war that had ended only 5 years prior to the new conflict, and by the importance of South and East Asia in the proximity of the war theater, as supplier of many agricultural and mineral industrial materials. The insecurity prompted a widespread build-up of strategic inventories, which added to demand and pushed up prices. Purely speculative demand also contributed to the market strength, but it probably played a lesser role than during the commodity booms of later times. This is because stock markets were buoyant in the early 1950s, and offered ample opportunities for profits (Shiller, 2000). Furthermore, smooth and flexible instruments for speculation in commodity markets had not yet been developed. The *indirect* impact arose from the boost to economic growth and industrial output that resulted from the war operations. Ample evidence is provided in Table 1 above, which shows an extremely strong macroeconomic performance in 1950 and 1951.

The inflationary performance during the first boom follows a somewhat unusual path. The MUV index indicates very little inflation for the whole of the 4-year period under scrutiny. It increased from 23.2 in 1948 (2000 = 100) to 23.8 in 1952, a rise of only 2.6%. The details depict a far less stable picture. A reference back to Table 1 reveals a sharp fall in the 1950 dollar prices of manufactured exports, primarily in consequence of the European devaluations late in 1949, and a similarly strong rise of these prices in 1951, as the European manufactured goods prices were adjusted to the new dollar parities.

When measured by the aggregate commodity index, this boom does not appear to be particularly strong. Commodity prices peaked in the first quarter of 1951 at a level 45% above 1949, used as the base year in the analysis of the first boom. Neither is it particularly durable. By the second quarter of 1952, the constant price increases had reduced to only 16% above the base year. The details of Fig. 3 suggest the boom to be limited, by and large, to seven quarters. A glance at Fig. 1, however, shows that after a further fall in 1953, prices rose again in 1954, but that is beyond my story of the first boom. Furthermore, the strong price rise is not general, but limited to only some commodity groups.

The graphs of Fig. 3 indicate strong increases in the second half of 1950 in the constant prices of agricultural raw materials and, to a lesser extent of metals, the former culminating at an index of 184 early in 1951, the latter reaching a peak of 140 in mid-1952. The prices of both commodity groups fell back later in 1952 as it became clear that the Korean war would not spread into a world-wide conflict, and with the sharp slowdown in economic growth recorded in that year. In addition, dramatic reductions in the strategic stock levels added to supply, and so contributed to the ensuing price weakness (Rowe, 1965).

The war and the macroeconomic spurt of the years had little impact on the prices of energy and food. The constant dollar index for energy never reached 120, while that for

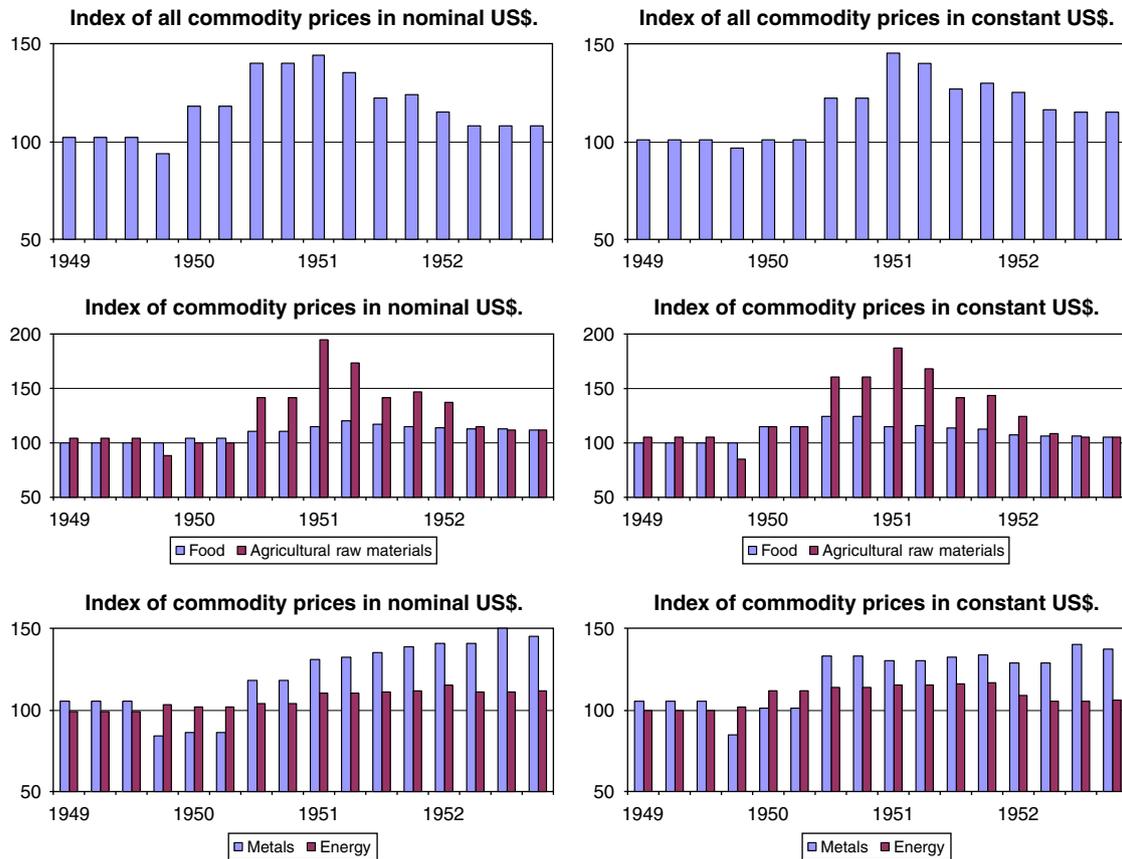


Fig. 3. The first commodity boom. Price indices 1949 = 100.

food attained 125 during two quarters of 1950, with a subsequent decline. An important explanation to the relative weakness of these commodity groups is that the major consuming countries were relatively self-sufficient in energy and food at the time, and that in any case there was little export of these materials from the proximity of the war scene. The OPEC cartel had not yet come into existence, the US was still a net oil exporter, while domestic coal dominated Western Europe's energy needs (Darmstadter et al., 1971). No significant harvest failures were reported at the time, and there was only a weak relationship between the economic boom in the industrialized nations and food prices, since the population of the rich world was well fed at all times.

By the end of the period under survey, the only remaining real impact of the commodity boom was a metals and minerals price level 20–30% higher than before the boom began. All other commodity prices, measured in constant dollars, were roughly the same in 1952 as they had been in 1949. For all practical purposes, the boom was a transient phenomenon.

### The second commodity boom

The second boom was much stronger than the first. It was also much more pervasive in that the prices of all commodity groups rose sharply. Similar to what happened

in the first boom, a very strong macroeconomic performance during 1972 and 1973 (see Table 1) constituted an important trigger to the rising commodity prices. But there were two additional triggers. One was that the boom had been preceded by two consecutive years of widespread crop failures, on which a dramatic cut in Peruvian fishery was superimposed. Peru's anchovy catch declined from 12.6 million tons in 1990 to 2.3 million in 1973 (FAO, 1974). The scarcity of food led to substitution in land use, e.g. from cotton or jute to grains, which in turn resulted in falling agricultural raw materials supply. Nineteen seventy three, therefore, saw deficient inventories both for food and agricultural raw materials (Radetzki, 1974). As is apparent in the graphs of Fig. 4, the upward price move was first experienced in these two commodity groups. The final trigger was of course the very sharp price increases instituted by the oil cartel late in 1973. Given the heavy weight of oil in international commodity trade, this had a strong repercussion on the aggregate commodity index.

A further dissimilarity from the first commodity boom was the very high inflation through the duration of the second boom. Not only did the period record very strong price rises, irrespectively how measured, for raw materials as well as for manufactures. The years were also characterized by chaotic changes in the parities between major currencies, all of which were freely floating after the dollar anchor had been removed. Measured by the

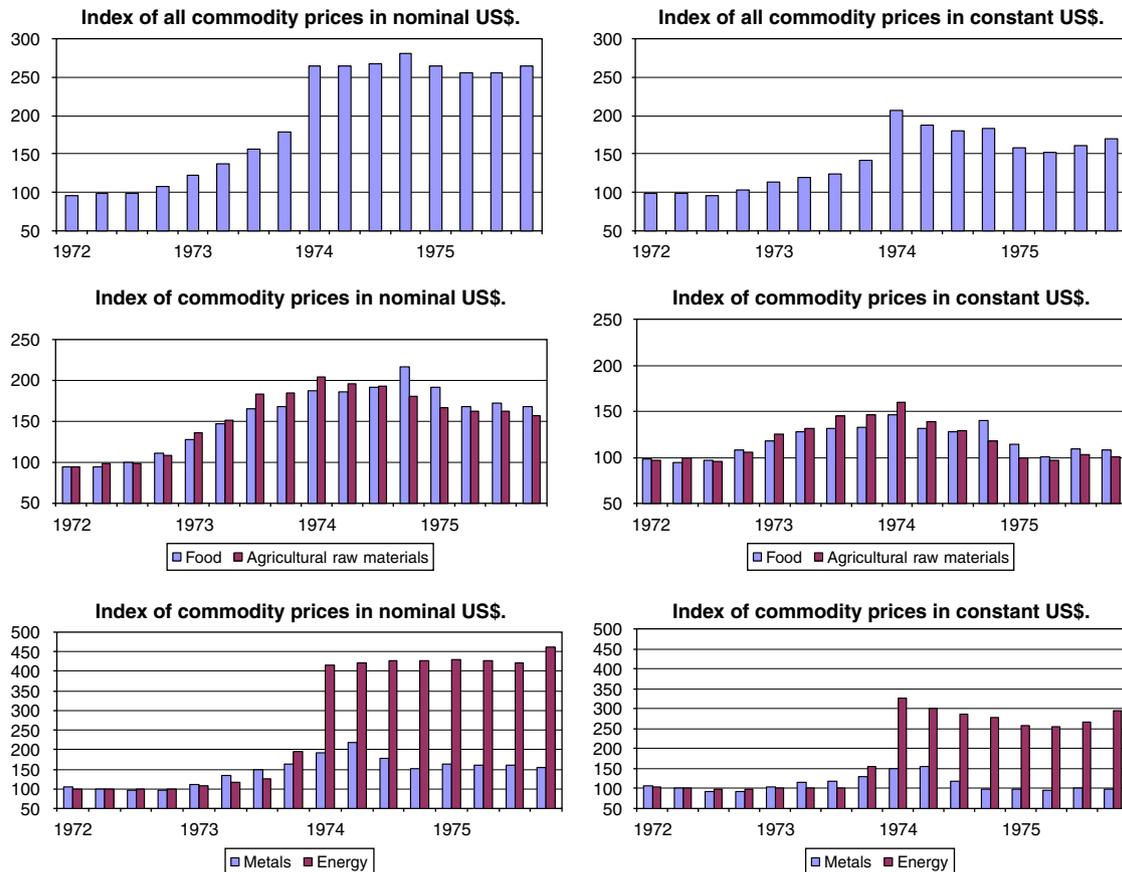


Fig. 4. The second commodity boom. Price indices 1972 = 100.

MUV-index inflation totaled no less than 75% over the 4-year period, a sharp contrast to the first commodity boom. A considerable difference between the nominal and constant dollar outcomes arises in consequence. The boom, therefore, emerges in very different lights when measured in nominal versus constant dollars.

The rampant inflation which at times resulted in negative real interest rates, the chaos in currency markets and the poor performance on the stock exchanges in the early 1970s (Shiller, 2000) led many investors to move out of bonds and shares and into real estate, art and commodities. The speculative demand for commodity inventories as a “safe” store of value was a further contributory factor to the commodity boom (Cooper and Lawrence, 1975).

The aggregate commodity price index in nominal dollars (1972 = 100) rose sharply in 1973, and remained above 250 through 1974 and 1975. The constant dollar index reached a maximum at just above 200 in the first quarter of 2004, and fluctuated between 150 and 200 in the following seven quarters. The individual commodity groups all attained their constant dollar peaks early in 1974: the energy index at about 330, all the other commodity indices around 150. In the course of 1974, under the weight of the recession, importantly prompted by the oil crisis (see Table 1), the constant dollar metals and agricultural raw materials indices fell back sharply, to end the years at 100. They remained at that level through 1975, when the recession

deepened. The metal prices were additionally depressed by large sales between mid-1973 and mid-1974 from the US government’s strategic stockpiles, and in late 1974 from excessive commercial stocks in Japan that had been built up in the preceding year (Cooper and Lawrence, 1975). The food prices fell too, though less steeply, given their lower sensitivity to the business cycle.

The constant dollar energy price index stands out from the other commodity groups. Energy prices rose significantly only at the end of 1973, later than the prices of other commodities, but by early 1974 the energy prices had risen by much more than any other commodity group. And despite fluctuations in the constant prices, prompted mainly by inflation, they remained 150–200% above the base year. The machinations of the oil cartel explain the difference. Oil dominates the energy price index, and the members of OPEC adjusted supply to the falling demand in 1974 and 1975, caused by the combination of deepening recession and the price shock (Radetzki, 1990). The cartel’s success in defending its desired price is clearly seen in the stability of the nominal prices from the beginning of 1974.

### The third commodity boom

The third commodity boom started in 2003 and, as is apparent from Fig. 5, it has not yet run its course. Like the

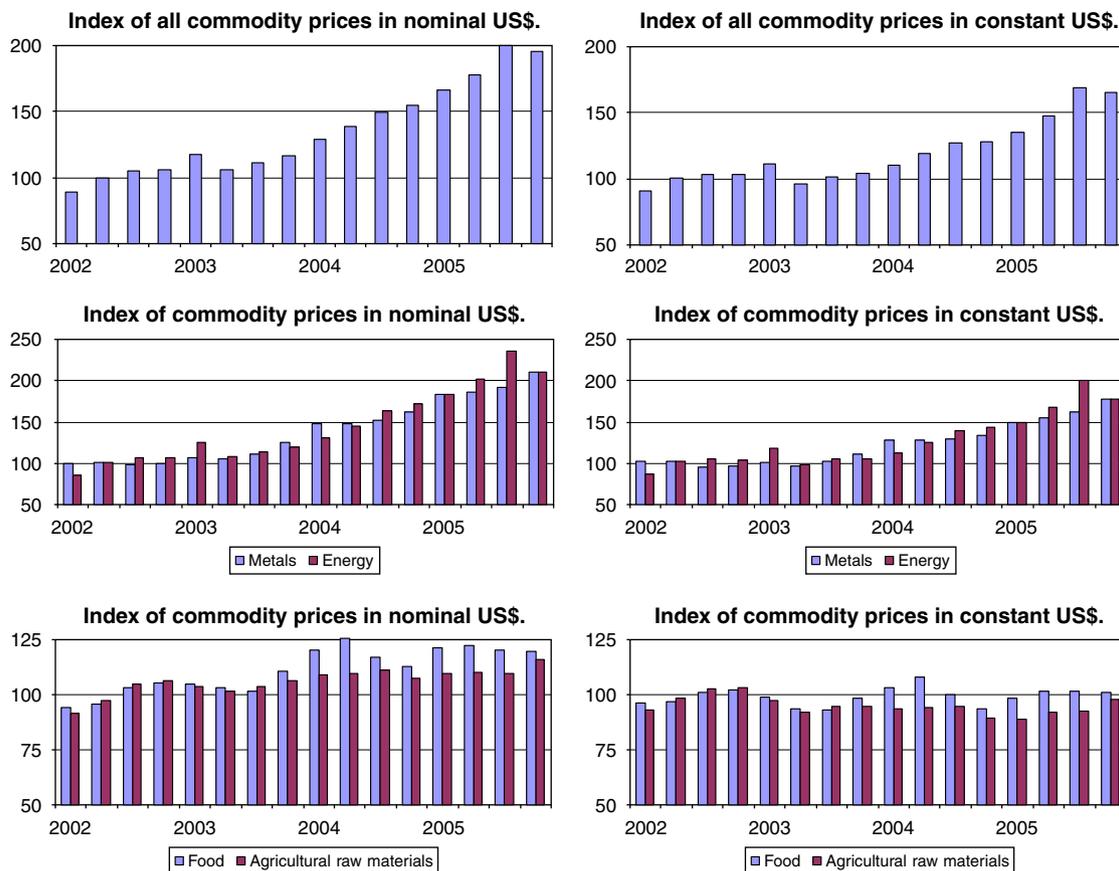


Fig. 5. The third commodity boom. Price indices 2002 = 100.

preceding booms, it was importantly triggered by a demand shock. The examples of oil and copper can be used as supplementary evidence to the numbers in Table 1: the 2004 global demand increase for both commodities was the highest on record over the preceding 30 years. Producers were caught unaware, and with the contemporary habit of just-in-time inventories in many production chains, and little spare production capacity, prices in many markets moved up strongly.

As in earlier commodity booms, the demand shock was importantly a result of fast macroeconomic expansion. In 2004, the year when commodity prices rose substantially, the economic growth in the OECD area accelerated strongly, and attained a historical high of 3.3% for GDP and 4.1% for industrial output. But a similar acceleration in developing Asia was probably of greater significance for commodity markets. For although the latter area accounted for only 27% of global GDP in 2005, compared with OECD's 52%, the two Asian giants China and India are presently passing through a development stage that is much more intensive in primary materials use than the dematerializing mature OECD economies. Especially, China stands out in this respect. The country's share of global demand growth for petroleum between 2000 and 2005, at 28% (IEA Oil Market Report, monthly) was almost double its share of global GDP in 2005 (15.4% in

PPP terms, IMF, 2006). In some metal markets, China's dominance has become unsustainably extreme. Its share of global demand growth between 2000 and 2005 was more than 50% for aluminum, 84% for steel and 95% for copper (Albanese, 2006).

I conjecture that a dollar added to the GDP in developing Asia absorbs more than twice the quantity of commodities as does a corresponding dollar's growth in the OECD countries. On this conjecture, the two regions would contribute about equally to commodity demand growth if their economies expanded at the same rates. But since developing Asia's economies expanded at more than twice the OECD rate (Table 1), it would follow that their contribution to commodity demand growth overwhelmed that of the OECD.

The importance of developing Asia in terms of total GDP, GDP growth and primary materials consumption is a new phenomenon. In 1973, during the second commodity boom, this region accounted for about 9% of world GDP compared with 68% for the rich market economies, and its growth rate between 1970 and 1974, less than 4.5% per year, was no higher than the average in the OECD countries. It was reasonable at that time to focus on the OECD and to ignore Developing Asia in rough assessments of what went on in world commodity markets. The situation has changed dramatically since that time. In the

early years of the new century such ignorance would lead the analysis seriously astray.

The inflation record across the third boom is a bit unusual, as was that of the first boom. While national statistics have recorded an extremely low inflation in all important countries, the MUV Index increased by 9.2% in 2003 and 7.5% in 2004. The inflation recorded by the index in the 2 years is almost entirely due to a sizable decline by some 30% in the US dollar parity versus the Euro. In 2005, the MUV index rose by a further 4.3%.

The aggregate commodity index reached a peak in the third quarter of 2005, at 166 in constant dollars (2002 = 100). The price performance has varied across commodities, however. The energy index, reaching almost 200 at its peak, recorded the strongest price increase. Oil, of course dominates this index. The small inventories resulting from OPEC production restrictions in the years preceding the boom, along with a further short output cut by the cartel early in 2005 contributed to the upward price push, as did the storm damage to production installations in the autumn of that year (IEA Oil Market Report, monthly). Oil prices remained at very high levels late in 2005 and early 2006, despite virtually full capacity utilization by OPEC. Metals and minerals prices rose as fast as energy until early 2005, then stagnated for a while, but ended at the same level as the energy index in the final quarter under review.

Speculative activity added substantially to the demand for metals and energy during the third boom. A negative stock market performance in the first years of the new century stimulated the view of commodities as a more profitable alternative and a useful financial portfolio diversification. Institutions and instruments had been developed to facilitate such speculation. Hedge funds, not known during the preceding booms, speculated actively in selected commodities. Ordinary pension funds were not immune from the fashion. The Goldman Sachs Commodity Index proved to be a popular investment vehicle. Professional speculators were at times excited by the political insecurity of the Middle East and its potential impact on oil prices. But it is exceedingly difficult, with the data made available by the commodity exchanges, to measure the impact of speculation on commodity prices.

In contrast, agricultural raw materials have hardly risen in price at all, and food only in small measure during the

third boom. This is surprising given that agricultural raw materials are intensively used in the booming manufacturing sectors of the major Asian economies. Similarly, one would expect demand for food to expand strongly, and prices to rise in consequence as the fast economic growth moves large population groups out of poverty in China and India. China, again, offers a possible explanation to the selective nature of the boom. The country's impressive macroeconomic performance during the present century has been importantly driven by construction, a sector that is a heavy user of metals and energy, but not equally dependent on materials of agricultural origin (private communication with John Tilton).

### A summary and reflections

Table 2 provides one type of overview of the three commodity booms. It shows the peak level for each of the commodity indices in constant dollars, along with the quarter when the peak occurred. The numbers reveal the second boom to be by far the most powerful in aggregate terms. But this is importantly because the energy prices went up so strongly in 1973 and 1974. The rise of the agricultural raw materials prices during the first boom overwhelms what happened during the second, while metals and minerals prices had their sharpest increase in the third boom. The second boom was not only the most powerful of the three in aggregate terms. It was also the most focused in terms of the timing when the peaks occurred; so far, the third boom appears least focused in this respect.

The preceding analyses of what happened to inflation around the boom periods reveal a very varied experience, with little support for any assertion of inflation as a trigger to booming commodity prices. The experience suggests that raw materials prices tend to rise by more in nominal terms in times of strong inflation, but that prices in constant money are not uniformly affected by the presence of general inflation. This empirical observation goes against the common a priori claims that price-raising speculative demand for commodities will be strengthened by the uncertainties caused by inflation.

I noted earlier in the paper that global growth of GDP and industrial production accelerated strongly in the periods just preceding or marking the beginning of the

Table 2  
Peaks in constant dollar commodity price indices during three booms

	First boom, 1949 = 100		Second boom, 1971 = 100		Third boom, 2002 = 100	
	Peak	Date	Peak	Date	Peak	Date
Aggregate index	145	Q <sub>1</sub> 51	207	Q <sub>1</sub> 74	169	Q <sub>3</sub> 05
Metals and minerals	134	Q <sub>4</sub> 51	155	Q <sub>2</sub> 74	177	Q <sub>4</sub> 05
Energy	117	Q <sub>4</sub> 51	326	Q <sub>1</sub> 74	200	Q <sub>3</sub> 05
Food	125	Q <sub>3</sub> 50	140	Q <sub>4</sub> 74	108	Q <sub>2</sub> 04
Agricultural raw materials	187	Q <sub>1</sub> 51	159	Q <sub>1</sub> 74	98	Q <sub>4</sub> 05

three commodity booms. This coincidence is so clear that I venture the assertion that all three commodity booms were importantly, though not exclusively, triggered by “demand shocks”. I say “not exclusively”, because, as is well known, the supply of agricultural commodities can be sharply affected by weather, especially so for geographically concentrated crops (e.g. coffee in Brazil). I noted above that the strength and generality of the 1973–74 boom was enhanced by widespread crop failures in the years preceding the commodity price explosion. I have also argued that the divergent price trend for petroleum is mainly due to the supply management actions of the OPEC cartel. But then, I also noted above that the extreme success in the launch of OPEC’s market control in 1973–74 was clearly related to its coincidence with a “demand shocks” when demand was buoyant and prices for all commodities rose strongly.

Not all periods of sharply accelerating macroeconomic performance give rise to booming prices in commodity markets. Other preconditions have to prevail, e.g. a tight production capacity situation and relatively small inventories. Such preconditions typically emerge after prolonged periods of weak commodity prices which discourage investments in capacity expansion and instill a sense that supply is secure, and there is limited need for inventory holding. The experience reviewed in the present paper is of course too limited for the suggestion that such conditions tend to emerge about four times per century.

The assertion that “demand shocks” typically constitute a trigger to commodity booms gains further credibility from the observation that commodity prices fell and the boom ended, in 1952, when growth in GDP and industrial production weakened sharply, and in 1974, when the world economy went into a deep recession, though, as noted, commodity prices were additionally weakened by large scale reductions of strategic and commercial stocks on both occasions.

The first and second commodity booms had a relatively short duration. The third boom, in contrast, perseveres in mid-2006 without any end in sight. This has raised the question whether supply responses have slowed in the new century because complex technology and more intricate regulatory frameworks extend the gestation periods of investments in mineral and energy production (private communication with Philip Maxwell).

In my view, changed supply responses are not needed to explain the past and current events. Investments in minerals and energy have historically required 3–5 years before the new installations were ready to produce (Tilton, 1990). The booms of the 1950s and 1970s collapsed due to a combination of economic recession and large-scale stockpile sales, long before the new facilities whose development was prompted by booming prices, became productive. The current boom has endured  $2\frac{1}{2}$  years and has not collapsed, because the world economy continues its strong expansion and because growing consumption has absorbed all output, so there are no excessive inventories to

release. If these conditions do not change, the boom will have one or two more years to run if the gestation of investments remains at 3–5 years, as before, or longer, if the supply responses have in fact slowed.

China and India, the two heavyweights in the developing world, have exhibited an extraordinary performance in recent years in terms of GDP and industrial production expansion, a consequence of far reaching deregulation and internationalization of their economies. I argued above that the economies of these countries presently pass through stages that are particularly intensive in raw materials use, and that they have therefore contributed importantly to world commodity demand. The economic successes of China and India may lead other developing countries to follow their deregulation and globalization path, with faster growth and speedily expanding commodity demand.

Will this scenario have a bearing on the frequency, strength and duration of future commodity booms and the long run raw material price levels? I think not, and for two reasons. *First*, to the extent that the policies of China, India and their followers result in increasing exports of manufactures from the developing world, such policies would raise the exporting countries’ demand for commodities, but at the same time reduce raw materials demand in the importing, economically mature nations whose economies would speed up their restructuring towards lesser materials intensity. And *second*, I assert that it is not the fast pace, but the irregularity of the global demand trends that causes commodity prices to rise sharply. Commodity producers can ordinarily accommodate speedily expanding demand without inflating costs if the demand trend is anticipated. Witness the extraordinary experience of the aluminum producers whose global output rose 40-fold in the 30-year period 1939–69, all while the constant dollar prices of this metal declined gently (Schmitz, 1979).

Also, there is little to suggest that faster consumption growth would lead to price rising depletion in the foreseeable future (Radetzki, 2002). The record of Fig. 1 exhibits clear long run price declines for the aggregate of non-fuel commodities and for metals and minerals separately, over more than 50 years, during which the volumes produced have multiplied. In markets that operate under competitive conditions, the prices should fairly reflect falling cost trends, clearly not a sign of resource depletion.<sup>4</sup>

Then there is the case of oil, whose price bears little relationship to costs, and which is importantly shaped by the oil cartel. The long run behavior of the cartel has been primarily expressed by an unwillingness to explore and to invest in additions to production capacity. Though OPEC controls some 75% of world proven reserves, including the economically most favorable ones located in the Middle East, it produced in 2004 only 4% more oil than it did in 1974. Over the same 30 years, the rest of the world, with

<sup>4</sup>Of course, the findings of Svedberg and Tilton (2006) quoted above provide a caveat to the argument forwarded here.

smaller and much inferior reserves, had expanded production by almost 70% (BP, 2006). This policy of restraint has permitted the cartel to charge monopolistic prices. The cartel's actions, not depletion, explains the sharp divergence in the path of oil prices and that of all other commodities, depicted in Fig. 1.

### Acknowledgment

Valuable comments on an earlier version of this manuscript from Chris Gilbert, Gustavo Lagos, John Tilton, participants at a seminar in the Mining Center of the Catholic University of Chile, and two anonymous referees, are gratefully acknowledged.

### References

- Albanese, T., 2006. Copper: running out of resources or harder to mine?, Rio Tinto paper presented at Commodity Research Unit's Fifth World Copper Conference, Santiago, 6 April.
- BP, 2006. Statistical Review of World Energy. Historical production numbers have been extracted from BP's website, [www.bp.com/statisticalreview](http://www.bp.com/statisticalreview).
- Cooper, R.N., Lawrence, R.Z., 1975. The 1972–1975 commodity boom. Brookings Pap. Econ. Act. 1975 (3).
- Darmstadter, J., et al., 1971. Energy in the World Economy. Resources for the Future, Washington, DC.
- FAO, 1974. Yearbook of Fishery Statistics, Catches and Landings 1973, vol. 36.
- IEA Oil Market Report, monthly, Dec 2005, March 2006.
- IMF, 2006. World Economic Outlook, April.
- Monthly Statistical Bulletin of the United Nations, Feb 1975, 1976, 2005, 2006.
- OECD, Historical Statistics. Published every two years, 1980, 2004.
- OECD, Main Economic Indicators, monthly, March 1976, 2006.
- Radetzki, M., 1974. Commodity prices during two booms. Skand. Enskilda Bank. Q. Rev. 4.
- Radetzki, M., 1990. A Guide to Primary Commodities in the World Economy. Blackwell, Oxford.
- Radetzki, M., 2002. Is resource depletion a threat to human progress? Oil and other critical exhaustible materials. Energy Sustainable Development—A Challenge for the New Century (Energex2002). Mineral and Energy Economy Research Institute, Polish Academy of Sciences, Krakow.
- Rowe, J.V.F., 1965. Primary Commodities in International Trade. Cambridge University Press, Cambridge, UK.
- Schmitz, C.J., 1979. World Non-Ferrous Metal Production and Prices 1700–1976. Frank Cass, London.
- Shiller, R., 2000. Irrational Exuberance. Princeton University Press, Princeton.
- Svedberg, P., Tilton, J., 2006. The *real*, real price of non-renewable resources: copper 1870–2000. World Dev. 34 (3).
- Tilton, J. (Ed.), 1990. World Metal Demand. Resources for the Future, Washington, DC.
- UNCTAD, 2006. Commodity Price Bulletin, monthly. The historical series were obtained from UNCTAD's website, [www.unctad.org](http://www.unctad.org).
- UNCTAD, 1976. Handbook of International Trade and Development Statistics, New York.
- World Bank, Market Outlook for Major Primary Commodities, 1980 and 1982. Published in the past every two years, several issues.