

Primary Commodities: Historical Perspectives and Prospects

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This paper treats four themes, intended to provide an historical framework for the analysis of national commodity export dependence. The *first* reviews the significance of primary commodities in the overall economy at different stages of economic development. The *second* theme tracks the long run decline in bulk transport costs, and explores the implications of this for the establishment of markets with a global reach. The *third* considers the 50-year wave of deep public intervention and control, in commodity production and trade, in the middle of the 20th century. The *fourth* theme reviews commodity prices, both long run trends and short run instability. A final section of the paper summarizes the historical findings and looks forward in an attempt to provide some insights of relevance for nations heavily dependent on commodity exports.

1. Primary commodities in the economic development process

The significance of the primary sector in a national economy is regularly reduced in the process of economic development. Long historical series to vindicate this statement are hard to come by. However, Simon Kuznets (1966) presents the following assessments of the shares of agriculture and mining in GDP in selected countries over extended periods of time. The contraction in the primary share emerges starkly from his figures:

Australia	c:a 1860	36%	c:a 1940	26%
Italy	c:a 1860	55%	c:a 1950	26%
UK	c:a 1905	41%	c:a 1950	13%
USA	c:a 1870	22%	c:a 1960	5%

Data on a more systematic basis do not become available until the late 1930s, and **table 1** presents time series for selected countries where these series are reasonably complete. Here too, the primary share exhibits a dramatic decline as the economies develop over time. The table additionally demonstrates far lower primary shares at each point in time for the richer countries, compared to the poorer ones. The latter cross section observation is confirmed by a broader sample of nations contained in **Figure 1**: There is a strong reverse correlation between the level of economic development, and the share of the primary sector in the economy.

A closer look reveals that at early development stages agriculture predominates in the primary sector. In Kuznets' assessments, for instance, the agricultural sector exceeded four fifths of the total for the initial year, except for Australia, where it was above 60%. Because of its dominance, agriculture also accounts for most of the recorded contraction of the primary share over time. The decline in the much smaller initial share accounted for by mining, is less

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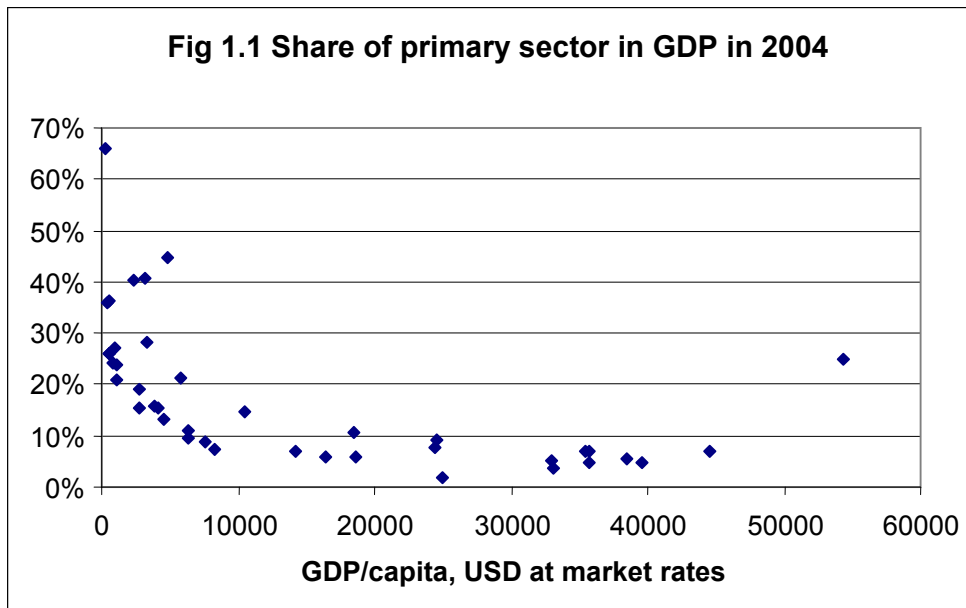
accentuated. In some cases (Italy, USA) that share appears to have remained relatively stable through the economic development process (Kuznets, 1966).

Exceptions to the observed regularity require mention, and Norway is an outstanding example. Its primary share has shown no decline over time in **Table 1** (the elevated oil and gas prices in 2006 undoubtedly contributed to the extreme value recorded in that year), and the country also represents an outlier position in **Figure 1**, combining a very high income level with an equally high primary sector share. The traditional importance of fishing in Norway's economy explains the heavy weight of the primary sector until the 1960s. The subsequent development of offshore oil and gas has made Norway exceedingly rich, while expanding the primary share even more.

Table 1. Share of agriculture and mining in GDP, per cent. Time series, 1938-2006.

	1938	1955	1975	1995	Latest
Argentina	25	19	15	8	15 (2005)
Canada	19	14	10	7	8 (2003)
India	--	45	40	31	21 (2005)
Italy	28	25	9	3	3 (2006)
Japan	23	24	7	2	2 (2005)
Norway	15	16	12	16	30 (2006)
South Korea	--	46	27	7	4 (2006)
Thailand	48	46	34	14	13 (2005)
Turkey	48	43	29	17	11 (2006)
USA	11	7	8	3	3 (2005)

Source: UN (annual).



38 countries selected to assure a wide spread in per capita GDP. Primary sector defined as agriculture, hunting, forestry, fishing, mining, and utilities.

Source: United nations statistics division, National accounts main aggregates database, <http://unstats.un.org/unsd/snaama/dnllist.asp>.

Even after taking account of existing exceptions, the data show clearly that the dominant pattern is a decline in the primary share of the economy as nations develop. In rich market economies the primary sector seldom exceeds 5% of GDP. Even in sparsely populated Australia and Canada, with an abundant export oriented agriculture and a rich mineral endowment, the primary sector contributes less than 10% of overall national value added.

The finding that the primary sector exhibits declining importance as economies develop is not particularly surprising. Simply expressed (and abstracting from the possibilities offered by foreign trade), a key element in the economic development process is rising productivity that permits the satisfaction of raw materials needs with ever lesser factor inputs. Labor and capital can then be switched to the secondary sector i.e. production of manufactures whose sophistication typically increases over time. As manufactures demand too, is eventually saturated, the factors of production can migrate again, now to the service sector. The overall economy expands, but the secondary and tertiary sectors more than the primary one, leaving the latter with a declining share of the total. The income elasticity of primary commodities is clearly less than 1.

With this perspective, the path of economic development can be seen as a process of dematerialization. Since all physical inputs originate in the primary sector, and since this sector accounts for a shrinking share of the total, it follows that each dollar's addition to GDP will carry a material weight that declines over time. **Table 2** illustrates what is involved. It presents the value in US\$ (2000) per kilogram of a set of goods and services, listed in an ascending order. The higher the value, the less primary material inputs will be needed per dollar value represented by the items. The essence of economic development is to move the center of the economy's gravity down the list, towards goods with ever higher value per kilogram. In consequence, as countries grow richer, the raw materials input needs will grow more slowly than the overall economy. Materials savings will be further boosted by technological progress which is typically weight reducing. The need for primary materials inputs tends to stagnate with economic development, and has started to shrink in absolute terms in some prosperous nations, as their economies grow even richer. In any case, global economic growth has exceeded the demand growth for virtually all raw materials.

Most of the global consumption growth in the course of the present century, has occurred in emerging economies, with an exceptional position for China, on account of that country's size and pace of economic expansion. In 2009, China accounted for 12.5% of world GDP in PPP-terms (IMF, 2010), but its share of global oil consumption *growth* in this century was 50% (BP, annual). In the case of copper, the growth of China's usage between 2000 and 2008 remarkably corresponded to 113% of global expansion (Cochilco, 2009), implying a 13% shrinkage in the rest of the world. An even more spectacular case occurred in iron ore trade, where China's import growth between 2000 and 2009 (560 mtons) corresponded to 125% of global import growth (450 mton) (UNCTAD, 2010), so excluding China, world imports declined by 25%.

It is easy to become complacent about the role and importance of the primary sector when its share of the economic activity settles at no more than a few percentage points, as is the case in many prosperous nations. Complacency may be in place so long as commodity markets function smoothly, and existing needs can be satisfied without serious hurdles. Complacency may also be encouraged by the fact that sophisticated modern economies have become masters of substitutability, permitting them to do without a particular material. But the ability

to substitute will be of no help against a general constraint on the supply of raw materials in aggregate, for it is overwhelmingly clear that not even the most modern economy can function without assured raw materials availability. The population will die if food supplies fail. The manufacturing sector is critically dependent on raw materials inputs, even if the volumes needed have shrunk impressively compared to the value of manufactured output. The service sector may require quite insignificant inputs of raw materials, but it clearly cannot function if these supplies fail. The classical Paley Report (Paley, 1952) puts it quite succinctly:

“The Materials Problem now demands that we give new and deep consideration to the fundamental upon which all employment, all daily activity, eventually rests: the contents of the earth and its physical environment.”

Table 2. Value in US\$ per kg, at prices in 2000

Iron ore	0.02
Steam coal	0.03
Wheat	0.12
Crude oil	0.21
Standard steel	0.25
Newsprint	0.40
Super tanker	2
Motor car	15
Dish washer	25
TV set	60
Submarine	100
Large passenger aircraft	600
Laptop computer	1000
Mobile telephone	2000
Jet fighter	6000
Windows 2000 Software, CD Rom	20000
Telecom satellite	40000
Banking service	almost ∞

Source: Radetzki (2001).

Primary commodities are indispensable, just like an ordinarily inconspicuous glass of water that acquires an immense value in the desert. This is easily forgotten, given the economic insignificance of raw materials in “normal” times when their availability is taken for granted.

2. Falling transport costs and globalizing markets

Prior to the mid-nineteenth century, freight rates on long hauls were prohibitively high except for goods with very elevated unit prices. In consequence, global commodity trade at the time was small in volume and consisted in the main of highly valued luxuries like coffee, cocoa, spices and precious or semi-precious metals, imported predominantly to industrializing Europe (Landes, 1980). The main subsequent changes in transport technology and transport costs for bulk materials, it seems, occurred in two spurts. The first took place in the latter half of the 19th century; the second began in the 1950s, and came to fruition in the 1970s. Each involved the globalization of numerous additional markets for commodities which until then had a limited geographical reach. Globalization involves not only trade flows across oceans

and between continents, but also, importantly, a convergence of prices across regional markets.

In the latter half of the nineteenth century, the application of steam power to transport revolutionized the economics of moving goods on land and across oceans. A large group of raw materials produced at increasing distances from the coast in overseas territories became economically accessible to the world's industrial centers as overland transport by oxen, horses and camels was switched to railways, and as metal steamships replaced wooden sailing vessels. This becomes dramatically evident in Paul Bairoch's (1965) numbers for the cost of shipping cotton and wheat from New York to Liverpool in constant (1910-1914) dollars per ton:

1825: 55.1 1857: 15.7 1880: 8.6 1910: 3.5

Shipping costs are akin to tariff barriers. Little trade will typically take place when the transport charges account for a dominant share of delivered price. Trade will be encouraged as this share declines.

The evolution of cereals imports into (western) Europe provides vivid illustrations of the evolving impact of transport cost decline on the widening of production sources. Odessa's short-run glory as a leading European port in the mid-1800s was based on booming shipping of Russian and Ukrainian rye and wheat to Western Europe. Much of this trade was lost in the 1870s, first because of a flood of steam-shipped American wheat after the end of the US civil war, and then the extension of Russian railways which took over the transport of remaining Russian cereals exports (*Economist*, 2004, Dec 16). At the same time, new rail connections from the prairies around Chicago to New York made the US cereals even more competitive in Europe. The bulk transport revolution continued during the following decades. Between 1880 and 1910, the transatlantic shipping cost declined from 18% to 8% of the price of wheat in the USA (Bairoch, 1965).

The 1880s also saw the introduction of refrigerated ships, permitting long distance transport of meat and fruit. The globalization of the markets for many food products speeded up European industrialization by assuring cheaper food supplies to the growing numbers of urban industrial workers. But it involved painful adjustments for European farmers, who lost out in many food products and agricultural raw materials like cotton and wool to overseas supplies. The impact was profound: In the 1850s, two thirds of British bread consumption was based on domestic cereals; by the 1880s that proportion had shrunk to 20% (Dillard, 1967).

The second spurt in transport technology was far more specific, and it was importantly triggered by the Suez crisis in the mid-1950s. The shipping industry's response to the canal closure was to opt for specialized huge bulk carriers, along with the concomitant loading and unloading facilities in the harbors, to permit economic transport of low value products like iron ore, steam coal, bauxite and oil across vastly extended distances. The impact of the effort began to be felt only in the 1970s. The result was a further dramatic decline in the cost of shipping, particularly accentuated for the truly extended, transoceanic transport routes.

Between 1960 and 1988, the average size of the bulk carrier fleet had more than doubled. In 1960, virtually all internationally traded iron ore and coal was shipped in vessels of less than 40000 dwt, but this proportion had declined to 10% or less by 1988. Carriers in excess of 100000 dwt did not exist in 1960, but by the latter year they accounted for 70% of iron ore and 40% of coal shipments (Lundgren, 1996). These tendencies have been further accentuated, and in the current century, carriers in excess of 200000 dwt completely

dominate additions to the bulk carrier fleet (private communication with Lennart Nilsson, the Institute of Shipping Analysis, Göteborg, Sweden).

The economic impact of the new bulk transport technology was very substantial, and especially so for the mining industries. Many European miners faced problems akin to those experienced by the farmers 120 years earlier. Freight rates for Brazilian iron ore to Europe declined from \$24 per ton in 1960 to \$7 in the early 1990s. At the same time, the costs for much shorter shipping distances, e.g. iron ore from Narvik in Norway to Germany were reduced from \$8 to \$4. The geographic protection afforded to the Swedish supplies shipped through Narvik thus shrank from \$16 to only \$3 (Lundgren, 1996). The freight rate as a proportion of total price for US coal in Western Europe was reduced from more than 30% to less than 15% in the 30-year period. The consequence was a fast evolution of global markets for these low-cost products. Long distance maritime iron ore trade rose from 23% of world production in 1960 to 36% in 1990 (Lundgren, 1996) and 56% in 2009 (UNCTAD, 2010). In 1960, trans-oceanic trade in coal accounted for 2% of global output (Lundgren, 1996) but by 2007 that share had risen to 14% (IEA, 2009).

The market for natural gas is the most recent to be subjected to the forces of globalization. Gas is an extremely bulky product (prices in the range of \$0.1-0.2/m³) with transport costs constituting a very high proportion of delivered price. Until at least the 1980s, transport by pipe was the completely dominant delivery mode. The lowest-cost gas sources had a limited geographical reach, because the transport cost was proportional to distance. Three regional markets developed around the main consumption centers, viz., North America, and Europe (including Russia), both predominantly supplied by pipe from internal sources, and Japan, Korea and Taiwan, supplied exclusively by liquid natural gas (LNG)² from Australia, Indonesia and Malaysia. Each of the three markets was, by and large, isolated from the others, with prices evolving along separate levels and patterns. Until the mid-1990s, the East Asian market recorded prices that were twice the level in the US and 50% higher than in Europe (BP, 2010) primarily because of the high cost of liquefaction and shipping. Since then, however, prices have been equalized in the three markets due to a combination of rising prices of piped supply and substantial cost reductions in the LNG production and transport technology. Both developments have stimulated a very fast growth of additional LNG sources, providing an extended web of long distance supply routes, in effect establishing a truly global market for natural gas. In 1989, 15% of global natural gas production was traded internationally, and the LNG share accounted for 22% (65 BCM) of the traded total (BP, 1990). By 2009, the traded share had risen to 37% (243 BCM), with one fifth of total trade as LNG (BP, 2010).

The successive technological revolutions have gradually reduced the transport costs of bulk commodities by a total of almost 90% between the 1870s and 1990s (Lundgren, 1996), and the more recent internet revolution by facilitating communications, has suppressed the cost of long distance trade even more. This, in turn, has increased the number of globally traded primary commodities, from selected high priced luxuries before 1850, to encompass virtually all products with perceptible values by 2005. Even waste, e.g. metal scrap or rejects from forestry and agriculture, or packaging material after use, valued as sources of energy extraction or of recycling, are increasingly subject to international trade. Chinese stone for garden decoration is being successfully marketed in Europe.

²Approximately 1.4 m³ of natural gas equals 1 kg of LNG, with prices in the range of 0.2-0.4\$/kg. The substantial compression makes LNG economically transportable by ship.

An important repercussion of the globalization of primary commodity markets has been a growing dependence of the world's manufacturing centers, initially Europe, then Japan and the US, and most recently China, on imported supply.

3. The entry and exit of the state in the commodity sector in the course of the 20th century

There has been a 50-year wave of far-reaching public and political intervention in primary commodity markets, beginning in the early 1930s. Since the late 1970s, however, the governments have been abdicating wholesale from their commanding positions in the primary commodity world.

I see four major and two subordinate factors explaining the deep public interventionism in global commodity production and trade. (i) The *1930s depression* led to a price collapse for many primary materials, so deep that it prompted public intervention to rescue the farmers and miners; (ii) The *second world war* created havoc in many supply lines, motivating government entry to restore order; (iii) The *breakup of colonial empires* established many newly independent economies dominated by raw materials, whose governments thought it imperative to expand control, especially in minerals and energy where ownership had traditionally rested in foreign hands; (iv) The second and third quarters of the 20th century were ideologically flavored by strong *beliefs in the need for collective action* to come to grips with the serious fallacies of the market system (Skidelsky, 1996). The subordinate factors comprise (v) The economic *ascendancy of the Soviet Union*, and its interventions in international commodity trade; and (vi) The concerns raised by the *emergent import dependence of the USA* in many strategic raw materials. Sometimes, one factor was enough to launch public action, but quite often, several of these factors reinforced each other in triggering state intervention.

In the 1930s depression, falling prices prompted joint action by the governments of Canada and the US in the wheat markets, to cut export supply and save farmers from further price falls. Similarly, Cuba collaborated with Java in launching export quotas in sugar. The colonial administrations of Malaya and Ceylon instituted export restrictions on rubber, but this scheme met resistance from consuming interests in the US, and soon collapsed (Rowe, 1965).

In the 1945-1965 period, with scarcities and price spikes of the second world war and the Korean conflict in fresh memory, commodity agreements were launched by governments, to keep prices within bands acceptable to both exporters and importers. Export controls and buffer stocks were the instruments used. The markets for sugar, wheat, coffee, tin and many others were subjected to such controls, but eventually they all disintegrated, primarily because they did not live up to the anticipated expectations (Radetzki, 1970).

The decade after the second world war involved a painful experience for the USA, as the country became dependent on imports of a widening group of commodities of critical importance in war and peace (Paley, 1952). This prompted the government to build strategic inventories, sometimes of very significant size. The extent to which these inventories assured stable supplies to the US is unclear, but their acquisition and subsequent disposal created serious instability in the commodity markets (Cooper and Lawrence, 1975; International Tin Council, annual and monthly).

The early 1970s also experienced commodity price and export controls in several countries, to assure supplies at low prices to domestic users. In the US, price ceilings combined with

export restrictions on many commodities were instituted for that purpose (Cooper and Lawrence, 1975). The gasoline queues in the US in 1974 were a direct consequence of the gasoline price caps. The Canadian government implemented severe constraints on uranium exports in the mid-1970s, purportedly to assure national needs (Radetzki, 1981).

Foreign aid became common after numerous nations in Africa and Asia gained independence in the 1950s and 1960s, and several commodity agreements were extended by adding elements of foreign assistance. One such extension involved guarantees by the importing member countries to buy predetermined quantities at above market prices. Another was “food aid” which might have improved nutritional standards, but at the same time made life harder for third world farmers (Radetzki, 1970). Sometimes, self-interest rather than altruism motivated the assistance measures, as in the coffee agreement which guaranteed Latin American producers more than the market price with the virtually explicit motive to prevent the spread of non-capitalist political systems (*Commodity Yearbook*, 1964; Rowe, 1965).

The Soviet Union was similarly active. It signed a number of “bilateral agreements”, in a few cases involving the entire commodity export of individual developing countries for many years, in exchange for manufactures. These agreements were regularly biased in favor of the exporting nation, with an implicit aim to gain political influence. Sometimes it did not work so well, for the “beneficiaries” as when the Soviet Union resold large quantities of Cuban sugar and Indian cloth in Western Europe, suppressing prices for the exporters’ sales outside the “agreement” (Radetzki, 1970).

Despite the courtship of developing countries by commodity importers, there was a massive wave of nationalizations, in the 1960s and 1970s of foreign owned positions, primarily in the minerals and energy fields. Compensation was meager in these takeovers. The US and UK lost most in the process, being the largest foreign direct investors in these sectors. The Soviet Union and Japan did not suffer much, since their ownership holdings were insignificant. The resultant state enterprises in minerals and energy brought in yet another tool for public intervention in primary commodities.

Governments started to retreat in the 1980s. Disappointment about the results of public interference became common. State entrepreneurship did not deliver as anticipated. A shift in beliefs also played a crucial role. The confidence in market solutions was boosted by the ideological revolution launched by Margaret Thatcher and Ronald Reagan. “Political failure” replaced “market failure” as the main problem to handle.

Far-reaching consequences have followed from the public retreat. International commodity agreements in which governments meddle for whatever objective have completely lost appeal. Instead, hedging on widely extended futures markets is used for the purpose of price stabilization. Publicly controlled strategic stocks in the present century are limited to petroleum, and at less than 5% of global annual consumption (IEA, monthly), they represent a trifle of the ambitious schemes of earlier decades. Government price controls have not been considered despite threefold price increases of materials like copper, iron ore and oil between 2002 and 2008. The market is seen as an adequate instrument for establishing the value of transactions between exporters and importers. No queues have been seen at the petrol stations or at the strategic metal warehouses in the rich world of late. Attempts in China, India, Indonesia and other emerging countries to shield consumers from the oil price rises in 2004-08 did result in queues in some cases, but have proved unbearably costly to the public budgets, and are being dismantled (IEA, monthly). A wholesale privatization occurred in the non-fuel mineral sector, but in contrast, state ownership continues unabated in the oil

industries of the developing countries, perhaps because of laxer performance requirements so long as the OPEC cartel continues to maintain monopolistic prices.

The governments' abdication from involvement in primary commodity markets has been quite impressive, though it is far from complete. The most important exception relates to the rich world's agricultural policies which continue to seriously distort the markets for a number of food products. In the mid-2000s decade, farm subsidies represented 34% of the value of overall farm receipts in the EU, and 58% in Japan (*Economist*, 2006a, July 1). For some products, subsidies exceed 100%. OPEC represents the other important remnant of public involvement in international commodity markets. Governments of the cartel's member countries have remained the dominant owners of the oil industry, and the state-owned oil enterprises worldwide control close to 90% of the world's conventional oil resources (*Economist*, 2010). The same governments keep a tight rein on policy, in terms of output and prices, as well as on the volume and direction of oil investments. They appoint the corporate managements, often on political merit, and they also control the financial resources available to their oil industry.

Despite these exceptions to public abdication in the primary commodity sectors, it is clear that the era of state interventionism is far past its peak, and that market forces concurrently play a greatly expanded role in international commodity markets.

Events in Bolivia, Russia, and Venezuela since the mid-2000 decade suggest that the temptation to maintain state control and to undertake further nationalizations in oil and gas remains strong, especially when prices and profits are high. Fears have been voiced that the recently ascending popularity of state control in some places may be a harbinger of a new wave of public intervention in the resource industries, after a 30-year withdrawal.

4. Real Prices: Falling Long-run Trends and Short-run Instability

The long run price trends

There are two well-argued and opposed lines of thought, about the direction of the trend in long run real commodity prices. The *first*, mainly theoretical tradition, asserting that commodity prices will be rising, derives its roots from classical economists Adam Smith and David Ricardo, is elegantly synthesized by John Stuart Mill (1848):

“The tendency, then, being to a perpetual increase of the productive power of labour in manufactures. while in agriculture and mining there is a conflict between two tendencies. the one towards an increase of productive power, the other towards a diminution of it, the cost of production being lessened by every improvement in the process, and augmented by every addition to population: it follows that the exchange value of manufactured articles, compared with the products of agriculture and of mines, have, as population and industry advance, a certain and decided tendency to fall.”

The notion about rising raw materials prices due to increasing pressures caused by land and mineral scarcities remained out of vogue for a long period during the 20th century because it was contradicted by many empirical observations. From the early 1970s, however, it attracted a temporary but intensive concern following the publication of the Club of Rome reports about an impending general depletion of resources, and then again during the commodity boom early in the present century, when fears of rising scarcity resurfaced in the proclamations of impending “peak oil” and similar production peaks for many other natural resources (Radetzki, under publication).

The *second* tradition is founded on empirical observations, and asserts a falling trend in real commodity prices. It was originally developed by Hans Singer (1950) and Raul Prebisch (1962) who argued that there is an asymmetry in the response of prices to productivity gains between commodities and manufactures. The markets for the former are highly competitive, so any productivity improvement leads to a price decline. The monopolistic organization of the labor and capital employed in manufactures production, in contrast, enables the factors of production to reap the benefit of productivity gains in the form of higher income. The Prebisch/Singer explanation of falling commodity price trends aroused an extended debate. The critics remained unconvinced, even though the performance of OPEC appears to support the Prebisch/Singer view.

There are several other, less controversial, reasons that could explain a long-run decline in real commodity prices. *First*, as noted, the income elasticity of demand for most commodities is low, so, the slower growth of commodity demand as income expands, would tend to result in a weaker commodity price development. In fact, Singer himself used this argument in support of his theory. The *second* reason is that transport costs ordinarily constitute a higher proportion of the delivered price of commodities than of manufactures. The secular fall in transport costs should therefore have resulted in a stronger decline in CIF commodity price quotations. *Third*, and probably most important, the manufactures price index in real terms is tricky to construct and interpret because of the continuous shifts in its product composition and of the quality improvements over time of individual manufactures (Svedberg and Tilton, 2006).

Many empirical attempts at establishing the long run commodity price trends in constant money have been undertaken, comprising Cashing and McDermott (2002), Cuddington et al (2007), Grilli and Yang (1988), Hadass and Williamson (2003) and Harvey et al (2010) among the more recent ones, and they have yielded very varied results. Depending on the end points of the series, the countries whose trade is covered, the deflator used, and the commodities included, the outcomes of these investigations have typically ranged between stagnant and substantially declining developments, apparently adding more support to the Prebisch/Singer thesis than to the one formulated by the classical economists. There seems to be some tendency for real raw material prices to fall in the long run.

Short run instability and commodity booms

“Rapid, unexpected and often large movements in commodity prices are an important feature of their behavior.” (Cashing and McDermott, 2002). This is a well known and oft repeated statement, as is the observation that the prices of manufactures tend to be more stable. Illustrations of violent commodity price gyrations, up as well as down, over relatively short time spans are easy to produce, even when the major commodity boom periods are excluded.

It is equally easy to point to the main reasons for the sharp commodity price instability. The price elasticity of demand for raw materials is usually quite low, given that the cost of such materials typically constitutes a small proportion of the finished product price. Furthermore, a given increase in demand for finished products will regularly result in a more accentuated increase in the demand for the raw materials employed, as the desired inventories are augmented from the finished product marketing stage back through the entire production chain.

Fluctuations in supply, too, contribute to price instability. Weather is an important cause to supply variations in agricultural crops, even though geographical diversification of production in recent decades has reduced the importance of this factor (IMF, 2006). Mineral supply can be caused to shrink due to strikes or technical accidents, but such failures would have to be widespread to significantly dent the global total. The price elasticity of supply would also be quite low, at least when capacity is fully utilized, which is normally the case in competitive markets. With the exception of annual crops, it takes an extended period of time to add to supply capacity, and in the meantime even small variations in demand will result in sharp changes in price.

The above, then, are the main explanations to the short run price instability observed in most primary commodity markets. Such instability is believed to cause serious macroeconomic problems to countries that are heavily dependent on the exports of one or a few commodities.

Commodity booms are characterized for the purpose of the present analysis as sharp simultaneous increases in the real price of a broad group of commodities. Using this definition, it is possible to detect three such booms in the period since the second world war, beginning in 1950, 1973 and 2003, respectively (Radetzki, 2006). They were all triggered by demand shocks caused by unusually fast macroeconomic expansion. In all three cases, commodity producers were unable to satisfy the speedy demand growth, and prices exploded to a level far above the long-run equilibrium, defined as the total cost of new marginal supply.

The first two commodity booms collapsed in 1952 and 1974, less than two years after they emerged, in response to profound global recessions, and an ensuing shrinkage in commodity demand. The progress of the third boom that began in 2003 has had a much more complex character (Radetzki, 2006). First, the price increases from the beginning of the boom period until the peak was reached, were stronger than during the two predecessors. Second, the durability of this boom was far more extended. In 2007, four years after prices started to rise, the high price levels persevered, with no recession sight. When the most profound global economic contraction since the 1930s depression eventually arrived in the second half of 2008, a sharp commodity price correction did indeed occur, but it was of a surprisingly short duration, and by the end of 2009, commodity prices were very high again, having recovered a major share of the preceding year's decline (IMFs Commodity Price Statistics on the Web). The explanation to the surprising commodity price recovery in the midst of continuing economic gloom is that the major emerging economies which have accounted for virtually all commodity demand growth in the most recent decade, were little affected by the global recession. Already by 2009, these nations had resumed their very fast economic expansion and their commodity demand growth accelerated again.

Claims have been made that the slack monetary policy and inflows of speculative capital into commodity markets in recent years have further boosted commodity prices during the third boom (e.g. Caballero et al, 2008), but in my view these claims are not credible. A financial impact on spot commodity prices requires that commodity inventories expand, and there is no convincing evidence of such expansion in the course of the current boom. On the contrary, a recent study by Irwin and Sanders (2010) asserts that "stocks were declining, not building, in most commodity markets over 2006-2008", the period comprising the sharpest commodity price increases.

Commodity price levels in the second half of 2010 continue far above their long run equilibrium (CITI Commodity Strategy, 2010; UBS Investment Research, 2010), as demonstrated by the very high profits generated by producers. A substantial decline can be

anticipated if global demand were to shrink, for whatever reason. Price declines will occur even in the absence of demand contraction, once investments in expanded commodity production capacity become productive. Capacity expansion, however, is proving surprisingly time-consuming (Radetzki et al, 2008).

5. Policy Implications for Commodity Exporting Nations

Several policy implications for nations heavily dependent on commodity exports follow from the above historical overviews. As is revealed by other chapters in the present volume, many other policy recommendations can be formulated for the commodity exporting nations, and what follows below is a partial set based exclusively on the deliberations in the present paper.

All else alike, the declining global significance of commodities in volume terms in the world economy implies that demand will expand at slower rates than economic growth. This can be seen as a disadvantage for commodity exporters in aggregate, but not necessarily for individual suitably positioned exporting nations, whose foreign sales can grow by additional market shares.

Most of the future demand growth is likely to occur in emerging economies, with China further enhancing its already important position as a commodity consumer. This suggests a redirection of any marketing efforts aimed at enhancing export sales from the rich, mature countries, where demand stagnates or declines, towards the emerging nations group.

A careful watch is warranted of any tendencies for a macroeconomic slowdown in China, to permit early adjustments to the dire consequences of deteriorating Chinese economic performance for the evolution of commodity demand and commodity prices.

The revolutions in transport costs make it increasingly futile to rely on any advantage based on geography. Suppliers are increasingly facing a truly global market in which they have to compete with output from virtually any corner of the world. This is a challenge but also an opportunity: Importing nations will take less account of the geography of their supply sources, and more of their reliability. Suppliers can gain entry to new markets, with distance constituting ever lesser deterrence, if they can assure the conditions sought by the importers.

There are valuable insights to be gained from the 50-year experience of public interference in the primary commodity sector. The fact that governments abdicated in disappointment from most of their involvements is a consideration to keep in mind when future policies are formulated. Price stabilization is clearly better handled through futures markets than with the help of government interference. Maintenance of prices above long run equilibrium with the help of public regulation commonly ends in a loss of demand with painful consequences to the suppliers. Producer market control to extract monopolistic prices is usually unstable, and the perseverance of the OPEC cartel is an exception to the rule, made possible by the extremely uneven distribution of oil resources in the ground. Resource rents are regularly better extracted through a coherent fiscal system than through public ownership, given that the inefficiencies of state enterprise result in serious rent dissipation.

Dependence on exports with falling long run price trends is obviously inferior to reliance on a bundle of export goods with more encouraging price prospects, but then, profitability and social benefit to the exporting country can nevertheless prevail if progress in technology assures a decline in costs parallel to the price developments.

Projections are usually formulated assigning an excessive weight to current conditions, and here a warning is in place. When considering future prospects for their economies, commodity exporters are well advised to be conscious that prices in the second half of 2010 are still under the influence of the most powerful commodity boom since the 2nd world war, and have far to fall if they are to attain their long run equilibrium levels.

The discussions in this paper have revealed that the one-sidedness of the commodity dependent economies involves numerous problems and risks, e.g. slow growth of demand, falling long run price trends and short run instability. But the analyses have clearly not established a general and unambiguous case for diversification. After all, commodity dependence is normally the result of competitive advantage that yields above-normal returns to the commodity sector. These yields may well be more than adequate to compensate for the disadvantages. Obversely, part of the resource rents contained in the above-normal returns will be forgone with forceful measures to diversify.

Commodity dependence does not constitute a general trap into technical or other backwardness. Contrary to frequent perceptions, commodity production often requires as much advanced technology and human skills as manufacturing. Modern agriculture and mining make heavy use of microbiology, electronics and the highly qualified labor that goes with these techniques.

Large and profitable primary commodity production, both agricultural and mineral, holds a prominent place in the economies of prosperous nations like Australia, Canada, Norway, Sweden and the United States, with long periods of fast growth behind them. Commodity production in these countries would be even greater if the resource base permitted. The markets or governments would force a contraction of the raw materials industries if they were unprofitable or otherwise socially undesirable.

I conclude, therefore, that a heavy concentration on commodity production in a national economy is not detrimental per se. Diversification out of a commodity sector that has lost its competitive advantage and superior profitability is certainly warranted. But it is much harder to find tenable arguments for a recommendation to, say, Ivory Coast, or Venezuela, both heavily dependent on the exports of a few raw materials, that they should reduce their commodity reliance by a greater emphasis on manufacturing.

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