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Impact of China and India on Global Commodity Markets
Focus on Metals & Minerals and Petroleum

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1. Summary

Commodity prices are in the midst of a multi-year upward trend, particularly for oil and metals. Agriculture prices have risen as well, but have lagged the other groups, as these markets have been generally well supplied. Oil and metals prices have risen to record nominal highs but in real terms most remain below peaks in the 1980s. Oil and metals markets have had similar experiences in recent years. In the late 1990s, low prices resulted in relatively low levels of investment and the shut-in of high cost capacity (in the case of oil, OPEC shut-in part of its low-cost capacity). Strong global demand, including exceptionally strong increases in China, forced inventories to low levels. Production was pushed up against capacity constraints in 2004 and prices surged upward. Continued strong growth in demand and shortfalls in production and capacity expansions in 2005-06 have kept markets exceptionally tight and prices have surged higher in 2006. In the case of oil, fears of supply disruption have also helped underpin prices.

China has emerged as one of the largest—often *the* largest—consumers of most primary commodities. For the main metals, China ranks first and consumes 24 percent of total world production. It also produces 31 percent of the world's steel output. In energy, China consumes 13 percent of the world's energy, including nearly one-third of the world's coal output. In agriculture, it is the largest consumer of wheat, rice, palm oil, cotton and rubber, and second largest consumer of soybeans, soy oil, and tea. China is also undergoing a significant change in its eating habits, reducing dependence on the traditional staples of cereals and rice, and increasing consumption of other products, such as meats and processed foods.

India is also an important consumer of commodities, ranking fifth in overall energy use and third largest consumer of coal. It ranks 7th or 8th for aluminum, tin and zinc consumption, as well as global steel production, and 11th for copper. In agriculture it has a much greater presence, being the largest consumer of sugar and tea, and the second largest consumer of wheat, rice, palm oil and cotton. India has also sharply increased its 'fats and oils' consumption, indicating some shift in food preference. India's economy is one-third the size of China's, and its GDP and commodity consumption has grown at slower rates than in China.

China's demand growth for metals has accelerated since 1999, consuming two-thirds of the growth in world metals output between 1999 and 2005. It has been a major driver in the recent surge of metals prices, although the failure of supplies to keep pace, low stocks and dollar depreciation have also contributed to the price gains. In petroleum, China has accounted for less than one-quarter of the growth in oil demand, and has not been the major driving force leading to high oil prices, like it has for metals. Oil prices have been mainly driven by disappointing non-OPEC supply growth, disruptions to supply, geopolitical concerns, and expectations of supply constraints going forward, including

OPEC production restraint. India has accounted for much less of the growth in metals and oil consumption, and has not been a major driver of higher prices.

China is a large net importer of oil, copper, iron ore, lead, nickel, and zinc, the prices of which have increased most. By contrast, China is a net exporter of aluminum, and this has been the main determinant of why aluminum prices have increased only a fraction of copper prices. China is also a large net importer of fats and oils (and cotton), and consumption is growing at double digit rates due to its shift in food preference and rising incomes. Should this trend continue it could have a large impact on these commodity prices. India is a net importer of oil and a number of metals, though not iron ore and zinc, and demand growth has been moderately strong. However, demand growth has not accelerated since 1999 as in China, and has not been a main driving force to higher prices. It is less import-dependent on agriculture commodities, but is a net importer of fats and oils, and could add to any pressures of these prices because of a shift in food presence along with China.

China and India are expected to account for more than half of the growth in global copper and aluminum consumption over the next two decades, with China accounting for about half of the growth. By extension, the two countries might account for half of the growth in total metal consumption over the period, with China representing the bulk of the increase. This presents a large challenge to the metals industry to almost double output over the next two decades. In petroleum, China and India are projected to account for less than 30 percent of the growth in world oil demand, with China representing just over 20 percent. While projected growth is much lower than for metals, the petroleum industry is also challenged to raise capacity by about a third over the next two decades.

The World Bank expects non-oil commodity prices to decline after prices peak in the current cycle. However the path will not be smooth, and prices are expected to remain volatile. Prices are not expected to return to levels of the 1990s due to rising costs and the difficulty developing new supplies from difficult areas. China, India and other developing countries have the potential to consume higher levels of metals and petroleum than typically forecast, and this would increase the strain on the respective industries to develop new supplies. However, prices are expected to be cyclical, and not become permanently higher at anywhere near recent price levels. In the case of oil, OPEC production restraint may also keep prices well above the costs of production. However, too high prices could again impact demand and supply as in the 1980s and ultimately result in lower prices.

2. China and India Share of Global Commodity Markets.

China has emerged one of the largest—often *the* largest—consumers of major commodities (Table 1). It leads or rivals the U.S. in most commodities, although it significantly lags in energy despite ranking number two. China is the largest consumer of major metals[1], the second largest user of energy, and the first or second largest consumer of many agriculture commodities. Between 1999 and 2005, China's metals consumption grew at a relatively high rate of 17 percent, while energy demand rose at a rate of 7 percent—less than the pace of economic growth of over 9 percent. Growth rates for a number of agriculture commodities were moderate—as is typical largely reflecting changes in population. However, for a few commodities, e.g., soybeans, soy oil and palm oil, there has been large double digit growth in China's consumption, reflecting a major change in food preference away from traditional cereals which are in decline. In addition, cotton and rubber consumption have had relatively large gains, tied to economic activity.

India ranks several places lower for metals and energy consumption, and recent growth rates have been lower than for China. For metals, consumption grew at an average rate of 7 percent between 1999 and 2005, compared with economic growth of about 6 percent, while the growth in energy was relatively moderate overall. For agriculture, India ranks high as major consumer because of its large population. It is the largest consumer of tea and sugar, and is the second largest consumer of a number of other commodities. However recent growth rates generally have been relatively modest.

Metals and Minerals

China. China consumes nearly ¼ of the world's major metals production and became the largest consumer of total main metals in 2003 (see graphs). Between 1990 and 2005 China's demand for major metals grew an average rate of 14.7 percent per year, and since 1999 growth surged at an average rate of 17 percent. China has been the largest steel producer for nearly a decade, producing nearly one-third of the world's steel, and more than 3 times that of Japan and the US.—the 2nd and 3rd largest producers. Between 1990 and 2000 China's steel production nearly doubled, growing at a rate of 6.5 percent. But between 2000 and 2005, steel production nearly tripled, rising at an average rate of more than 22 percent. As such, China is the largest consumer of iron ore. Between 2000 and 2004, China imported two-thirds of the world's traded iron ore, with imports growing at a rate of more than 30 percent.

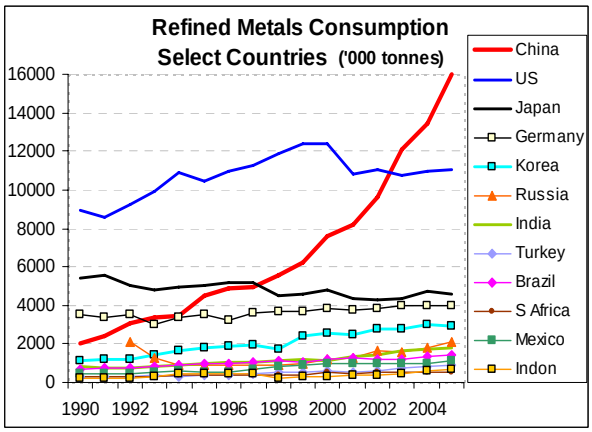
India. India consumes less than 3 percent of the world's metals, and consumes little more than 10 percent that of China—despite its GDP being 1/3 the size of China's. However, its growth of metal consumption has been relatively high, increasing at an average rate of 7 percent since 1992. It ranks within the top 10 consuming countries for tin (7th) and aluminum and zinc (8th), and is the 7th largest steel producer—but produces less than 4 percent of the world's steel and little more than 10 percent that of China. Unlike China, India produces essentially all of its iron ore needs, and exports about half of its iron ore output.

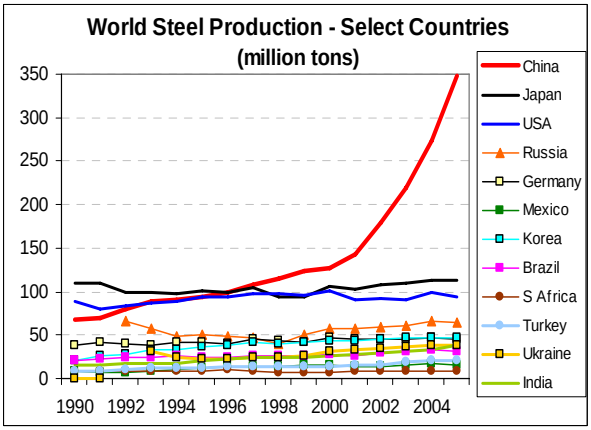
[1] Aluminum, Copper, Lead, Nickel, Tin and Zinc.

Table 1. Consumption and World Ranking of Primary Commodities for China, India, and the U.S.

		China		India		US		China	India	US	World
	Units	Volume	Rank	Volume	Rank	Volume	Rank	Share of World (%)	Share of World (%)	Share of World (%)	Volume
METALS 2005											
Aluminum	000 tons	7,119	**1**	941	**8**	6,114	**2**	22.5	3.0	19.4	31,581
Copper	000 tons	3,665	**1**	398	**11**	2,336	**2**	21.6	2.3	13.8	16,964
Lead	000 tons	1,940	**1**	96	**15**	1,469	**2**	25.7	1.3	19.4	7,554
Nickel	000 tons	201	**1**	12	**17**	126	**3**	15.2	0.9	9.5	1,317
Tin	000 tons	116	**1**	8	**7**	42	**2**	33.3	2.2	12.1	347
Zinc	000 tons	2,926	**1**	315	**8**	924	**2**	28.6	3.1	9.0	10,246
Iron Ore*	000 tons	353,838	**1**	58,969	**5**	57,976	**6**	29.0	4.8	4.7	1,221,624
Steel Production	000tons	348,409	**1**	39,098	**7**	93,610	**3**	31.5	3.5	8.5	1,106,082
ENERGY 2003											
Coal	Mtoe	850	**1**	184	**3**	531	**2**	32.9	7.1	20.6	2,584
Oil	Mtoe	270	**2**	124	**7**	921	**1**	7.4	3.4	25.3	1,798
Total Primary Energy	Mtoe	1,190	**2**	342	**5**	2,213	**1**	12.6	3.6	23.4	9,436
Electricity Generation	GWh	1,907,384	**2**	633,275	**5**	4,054,353	**1**	11.4	3.8	24.3	16,661,367
AGRICULTURE 2003											
Wheat	000 tons	86,222	**1**	76,482	**2**	30,851	**4**	15.2	13.5	5.4	567,269
Rice	000 tons	113,142	**1**	81,551	**2**	3,976	**12**	29.7	21.4	1.0	380,952
Maize	000 tons	110,531	**2**	14,136	**6**	211,222	**1**	17.0	2.2	32.5	650,627
Soybeans	000 tons	36,841	**2**	7,050	**5**	46,151	**1**	19.2	3.7	24.0	192,309
Soy Oil	000 tons	6,856	**2**	1,798	**4**	7,199	**1**	24.4	6.4	25.7	28,048
Palm Oil	000 tons	4,092	**1**	3,962	**2**	154	**37**	15.8	15.3	0.6	25,889
Sugar	000 tons	11,317	**3**	26,066	**1**	21,388	**2**	6.6	15.2	12.5	171,219
Tea	000 tons	552	**2**	671	**1**	145	**7**	14.4	17.5	3.8	3,822
Coffee	000 tons	31	**45**	57	**27**	1,222	**1**	0.4	0.8	16.8	7,292
Cotton	000 tons	5,927	**1**	2,426	**2**	1,301	**5**	31.2	12.8	6.9	18,974
Rubber	000 tons	1,917	**1**	686	**4**	1,056	**2**	23.5	8.4	12.9	8,171

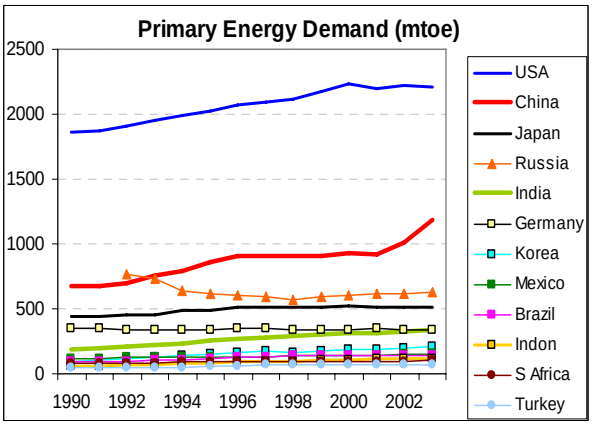
* Iron Ore Apparent Consumption 2004
Source: WBMS, IEA, FAO, IISI.





Energy

China. China is the world's second largest energy consumer, but well behind the leader, the U.S., which consumes nearly one-quarter of the world's primary energy production. China consumes less than 13 percent of global primary energy, and over the 1990-2003 period its energy demand rose at an average rate of 4.4 percent (Table 2)—about half the pace of economic growth. China uses coal to fuel more than two-thirds of its energy needs, and consumes one-third of the world's coal—most of which is produced domestically. In the late 1990s China chose to reduce inefficient coal consumption and closed a number mines for various economic, environmental and safety reasons—however some attribute this more to quirks in the data than changing patterns of production and consumption of coal. With surging economic activity in recent years, China's coal consumption has increased sharply, mainly for power generation. Electricity demand has accelerated along with burgeoning economic growth, but power supply has failed to keep pace, resulting in power shortages and blackouts. Electricity generation has risen on average at around 9 percent per year since 1990, but much large investments in new capacity in recent years are expected to bring the power market back into balance in 2006-07.



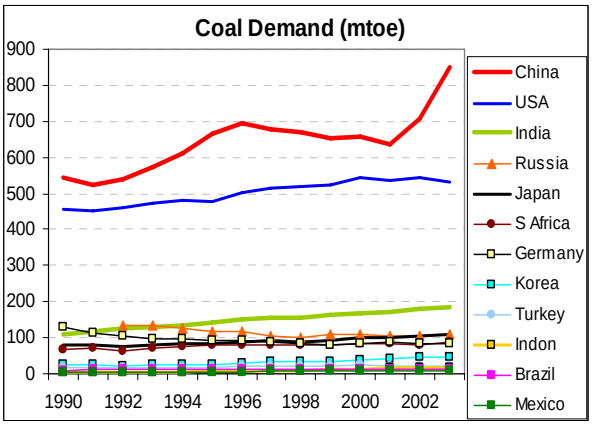


Table 2. Commodity Consumption Growth Since 1990

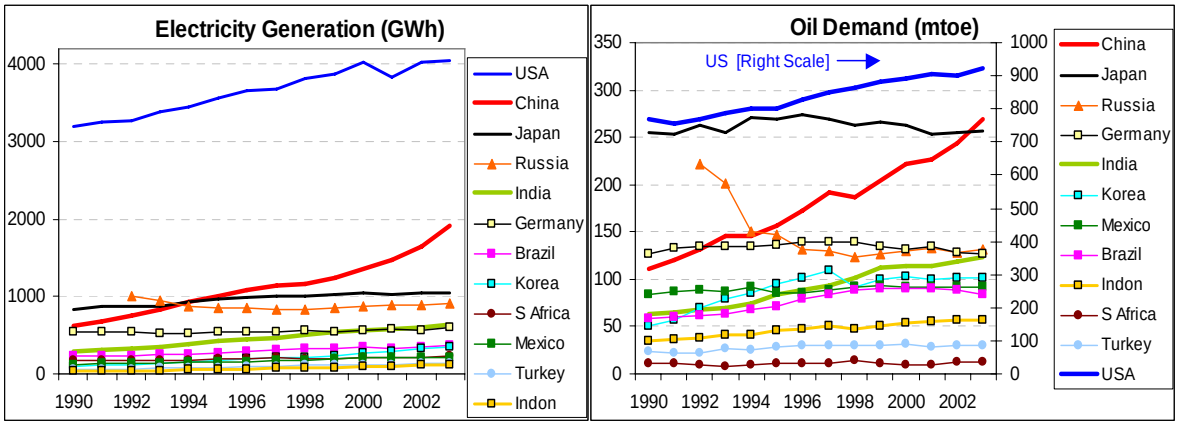
		China		India		USA		World	
		Volume	% pa	Volume	% pa	Volume	% pa	Volume	% pa
METALS		1990-2005	1990-2005	1990-2005	1990-2005	1990-2005	1990-2005	1990-2005	1990-2005
Aluminum	000 tons	6,258	15.1	508	5.3	1,784	2.3	12,415	3.4
Copper	000 tons	3,153	14.0	266	7.6	186	0.6	6,184	3.1
Lead	000 tons	1,696	14.8	16	1.2	194	0.9	2,206	2.3
Nickel	000 tons	173	14.2	-3	-1.4	-1	-0.1	475	3.0
Tin	000 tons	90	10.6	5	8.4	5	0.9	111	2.6
Zinc	000 tons	2,557	14.8	180	5.8	-68	-0.5	3,678	3.0
Iron Ore*	000 tons	258,657	9.8	36,872	7.3	-12,128	-1.3	334,822	2.3
Steel Production	000tons	281,168	11.6	24,232	6.7	4,948	0.4	372,739	2.8
ENERGY		1990-2003	1990-2003	1990-2003	1990-2003	1990-2003	1990-2003	1990-2003	1990-2003
Coal	Mtoe	308	3.5	75	4.1	73	1.1	385	1.2
Oil	Mtoe	160	7.1	61	5.4	151	1.4	570	1.3
Total Primary Energy	Mtoe	511	4.4	153	4.6	347	1.3	1,745	1.6
Electricity Generation	GWh	1,286,184	9.0	343,916	6.2	851,540	1.8	4,858,357	2.7
AGRICULTURE		1990-2003	1990-2003	1990-2003	1990-2003	1990-2003	1990-2003	1990-2003	1990-2003
Wheat	000 tons	-23,238	-1.8	27,844	3.5	-5,418	-1.2	11,580	0.2
Rice	000 tons	-9,733	-0.6	9,807	1.0	1,001	2.3	40,053	0.9
Maize	000 tons	18,451	1.4	5,162	3.6	56,689	2.4	162,453	2.2
Soybeans	000 tons	25,159	9.2	4,404	7.8	10,680	2.0	85,305	4.6
Soy Oil	000 tons	5,594	13.9	1,373	11.7	1,673	2.1	12,189	4.5
Palm Oil	000 tons	2,740	8.9	3,664	22.0	-31	-1.4	15,262	7.1
Sugar	000 tons	16	5.9	34	7.2	42	0.3	1,316	1.5
Tea	000 tons	169	2.9	182	2.5	61	4.3	1,003	2.4
Coffee	000 tons	2,036	1.5	6,814	2.4	4,838	2.0	35,164	1.8
Cotton	000 tons	734	1.0	1,092	4.7	-378	-1.9	498	0.2
Rubber	000 tons	1,205	7.9	337	5.3	249	2.1	2,858	3.4

* Iron Ore 1990-2004.

Source: WBMS, IEA, FAO, IISI, World Bank.

China became the second largest consumer of oil in 2003, overtaking Japan, but remains well behind the U.S. which consumes nearly one-quarter of the world's oil output. China consumes more than 7 percent of the world's oil, up from less than 3 percent in 1990, as oil consumption grew at an average rate of 7.4 percent over the 1990-2005 period—although the pattern of growth of apparent demand has not been smooth, as annual changes fluctuate significantly due to stocking patterns and other factors.

India. India is the world's fifth largest energy consumer, but uses less than 4 percent of the world's primary energy, and less than one-third that of China. Energy demand has grown at a similar rate as China's since 1990, at 4.6 percent, but has remained moderate in recent years while in China energy demand has accelerated. India uses coal for more than half of its energy needs, and is the world's third largest coal consuming country. However it uses only 7 percent of global output. Coal demand grew an average 4.1 percent between 1990 and 2003, while electricity generation grew at a rate of 6.2 percent.



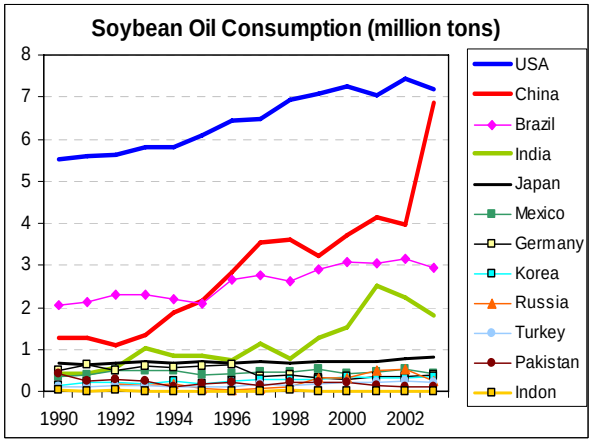
India is the sixth largest oil consuming country, but consumes less than 4 percent of the world's oil. It consumes less than half the volume of China, but as a share of total energy demand, oil is much larger than in China, at 36 percent versus 23 percent, respectively. India's oil demand grew at an average rate of just over 5 percent over the 1990-2005 period, also below the pace of economic growth.

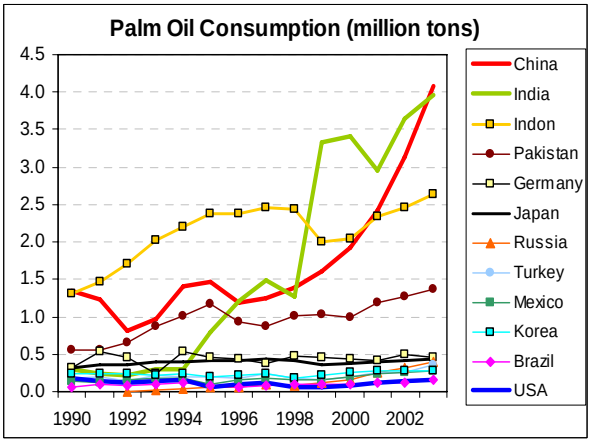
Agriculture

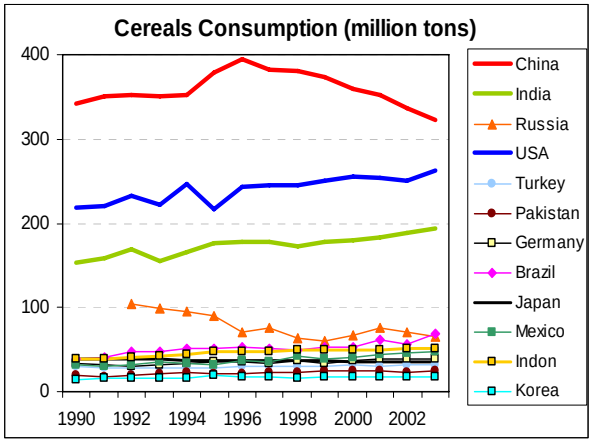
China. China is the first or second largest consumer of a number of agricultural commodities, mainly reflecting its large population. China is also in the midst of a significant shift in its eating patterns, reducing dependence on the traditional staples of rice and wheat to other products such as meats, fruits and processed food. The changes are driven by rising incomes, more open markets to sources of raw and processed food, and changing eating habits, e.g., meals away from home[2]. Since the mid-1990s, cereals consumption has fallen, and declines have occurred in wheat, maize and rice. At the same time, consumption of soybeans, soy oil and palm oil has risen sharply, reflecting this change in preference. Soybeans consumption has been growing at about 15 percent in

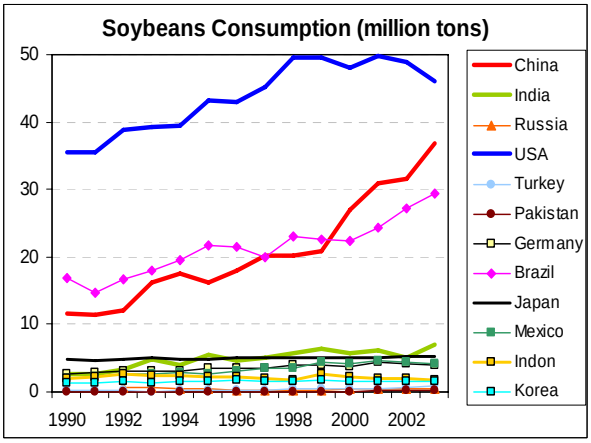
[2] Gould and Villarreal.

recent years, while soy oil and palm oil have been surging at more than 20 and 25 percent, respectively.

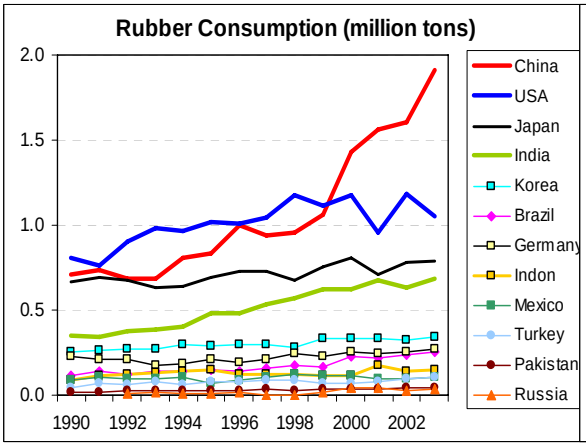


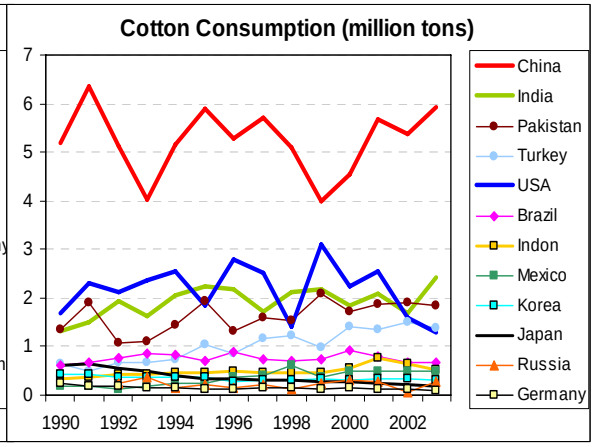






China's rubber consumption has also accelerated, rising at a rate of 16 percent, owing to strong economic growth, rapid industrial development, and the surge of new vehicles. Cotton consumption has fluctuated and has been rebounding in recent years, although not to previous peaks.





India. Like China, India consumes a sizeable share of many agriculture commodities because of its large population. It is the largest consumer of tea and sugar, and the second largest consumer of wheat, rice, cotton and palm oil—the latter recently overtaken by China. Unlike China, growth rates in most of the agriculture commodities have been fairly moderate. Only palm oil and to a lesser degree, soybean oil, have experienced more rapid growth, and are also likely due to changing eating patterns and rising incomes.

Net Exports

The main importance of China and India to global commodity markets is whether they are net importers or exporters. In metals, for example, China is a large importer of copper, and this has contributed to the sharp rise in prices the last couple of years. In aluminum, however, China is a net exporter, and this has contributed to much weaker prices for aluminum relative to copper in the current cycle.

China. China is a major importer of copper, lead, nickel, zinc and iron ore (Table 3). As the largest consumer and importer, China has contributed significantly to the surge in prices in recent years for all of these commodities. China is also a net importer of petroleum, but its share of oil consumption and imports is much smaller than for metals. Its growth in consumption has also been more moderate (with the exception of 2004) than for metals, and it has had far less impact on oil prices than for other commodities. China is a net exporter of coal, but its exports are decreasing, and thus it plays an important role in the global trade balance and international prices for coal. In agriculture, China is a large importer of soybeans, soy oil and palm oil, and has contributed to spikes in these prices in recent years. It is also a large importer of rubber, and has contributed to record high rubber prices—although high oil prices have been a main determinant in the rise of rubber prices. China is also a net importer of cotton.

India. India is a large net importer of copper, lead, nickel and tin. However, its share of consumption is small compared with China, as is its volume growth. Thus India has been much less of an influence than China on the rise in metals prices. India is a net exporter of zinc and iron ore, and therefore benefits from the higher prices of these commodities. In energy, India imports a larger share of its oil to satisfy its energy needs than China, but its volume is considerably smaller. It is also a modest net importer of coal. That said, India is important as an incremental importer of both fuels, but was not a major factor in the recent rise in these prices. In agriculture, India is a large importer of soy oil and palm oil, and a moderate importer of wheat. For fats and oils, India could have a major impact on prices, along with China, because of the change in food preferences and rapid rise of imports. For a number of other commodities, India is a net exporter, e.g., sugar, rice, maize, tea and coffee.

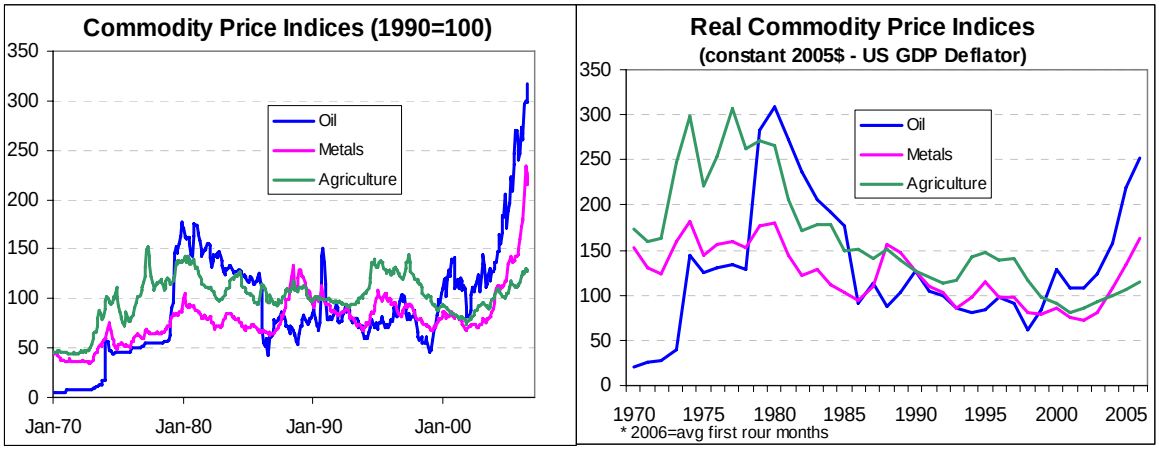
Table 3. Production/Consumption Ratios and Consumption Growth Since 1999

	China	India	US	China	India	US
	Prod/Cons ratio	Prod/Cons ratio	Prod/Cons ratio	Cons Growth (% pa)	Cons Growth (% pa)	Cons Growth (% pa)
METALS	**2005**	**2005**	**2005**	**1999-2005**	**1999-2005**	**1999-2005**
Aluminum	1.097	1.002	0.406	16.0	8.1	2.6
Copper	0.178	0.066	0.491	16.3	5.3	-1.9
Lead	0.651	0.559	0.306	24.3	-4.3	-2.3
Nickel	0.298	0.000	0.000	31.7	-8.0	-1.8
Tin	1.034	0.000	0.000	19.6	1.0	-2.7
Zinc	0.623	1.366	0.800	16.1	2.1	-3.0
Iron Ore*	0.412	2.045	0.943	16.2	8.1	-2.5
Steel Production				18.8	8.3	-0.4
ENERGY	**2003**	**2003**	**2003**	**1999-2003**	**1999-2003**	**1999-2003**
Coal	1.082	0.931	0.990	6.8	3.3	0.5
Oil	0.629	0.312	0.381	7.2	2.4	1.2
Total Primary Energy	0.976	0.713	0.707	7.1	2.9	0.5
Electricity Generation				11.4	4.3	1.1
AGRICULTURE	**2003**	**2003**	**2003**	**1999-2003**	**1999-2003**	**1999-2003**
Wheat	1.003	0.852	2.068	-6.0	3.3	-2.9
Rice	0.957	1.067	1.515	-3.0	0.3	-0.9
Maize	1.049	1.041	1.216	-2.2	4.7	2.4
Soybeans	0.418	0.965	1.447	15.5	2.2	-1.7
Soy Oil	0.710	0.605	1.077	20.9	8.7	0.4
Palm Oil	0.054	NA	1.385	26.5	4.5	24.9
Sugar	1.038	1.115	0.954	11.3	13.4	0.2
Tea	1.429	1.249	0.000	1.7	-0.4	1.7
Coffee	0.685	4.820	0.003	6.1	0.4	0.2
Cotton	0.820	0.966	3.055	10.3	2.7	-19.4
Rubber	0.295	1.012	1.060	15.9	2.5	-1.2

* Iron Ore Production/Consumption 2004; Consumption growth 1999-2004.
Source: WBMS, IEA, FAO, IISI, World Bank.

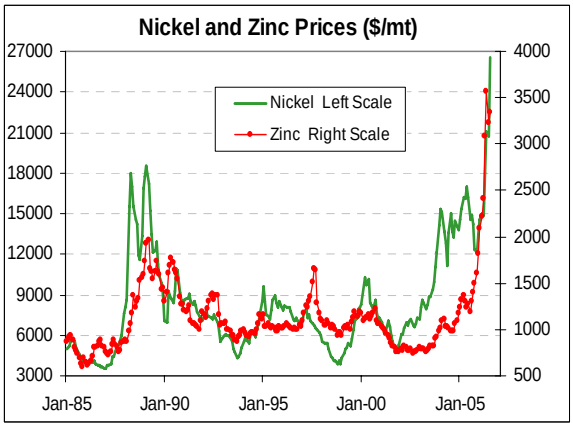
3. Trends in Global Commodity Markets and Prices – Importance of China and India

Commodity prices are in the midst of a multi-year upward trend, particularly for oil and metals. Agriculture prices have risen as well, but have lagged the other groups, as these markets have been generally well supplied. In real terms, agriculture prices are substantially below former peaks. Oil and metals prices have risen to record nominal highs but in real terms most remain below peaks in the 1980s. Oil and metals markets have had similar experiences the past decade. In the late 1990s, low prices resulted in relatively low levels of investment and the shut-in of high cost capacity (in the case of oil, OPEC's large surplus capacity of low-cost oil was kept of the market since the early 1980s). Strong global demand, including exceptionally strong increases in China, outstripped supply and forced inventories to low levels. Production was pushed up against capacity constraints in 2004 and prices surged upward. Continued strong growth in demand and shortfalls in production and capacity expansions in 2005-06 kept markets exceptionally tight and prices soared higher in 2006. In addition, the sharp rise in oil and metals prices has been supported by substantial financial sums invested in these groups as an asset-class. Because of expected strong demand in China and continuing capacity constraints, the current cycle of oil and metals prices are likely to be longer and higher than previous cycles.



Metals

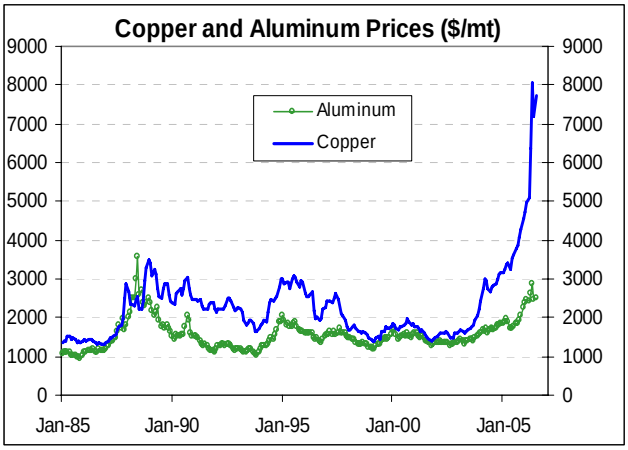
Metals prices generally began increasing sharply in late 2003 due to strong demand (particularly in China), earlier closures of production capacity, declining stocks, and depreciation of the U.S. dollar. ***Nickel*** prices actually began increasing in 2002 due to strong demand for stainless steel and increasing supply constraints. Prices reached a relatively high plateau in 2004, and Chinese stainless steel producers began using low-grade nickel or substituting to



other materials because of high nickel prices. However, the quality of stainless steel suffered, and some Chinese producers reverted to greater nickel use. Nickel prices declined in 2005 due to rising stocks and a slump in stainless steel production. However, nickel prices rebounded sharply in 2006 along with resurgent stainless steel production—led by China. With limited nickel supply prospects the next couple of years, prices have surged to record levels.

Zinc prices have typically lagged other metals during price rallies. Zinc prices moved moderately higher in 2004 but did not start to climb in earnest until 2005. In 2006 zinc has outperformed the other metals year-to-date in August, with the exception of nickel. Prices have soared because of sharply declining inventories, strong demand to galvanize steel—again led by China—and limited prospects for mine supply growth this year and possibly in 2007.

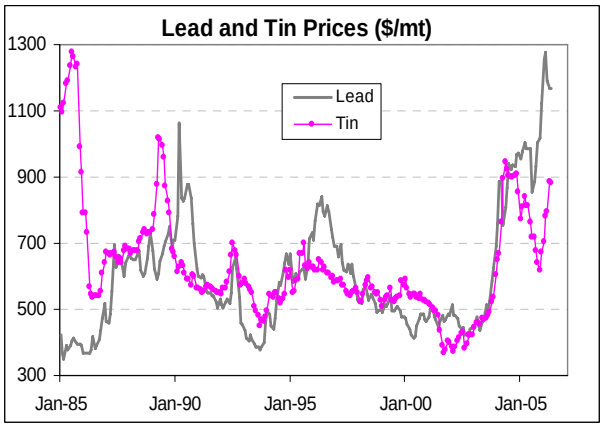
Copper prices began rising in late-2003 due to strong demand, falling stocks and the impact of earlier capacity closures when prices were low. Strong Chinese demand growth has been a main contributor to higher prices. However, numerous supply shortfalls—due to strikes, technical problems, lower ore grades, and delays bringing on new capacity—have been the main factor that have kept stocks chronically low and propelled prices to record nominal highs in 2006.



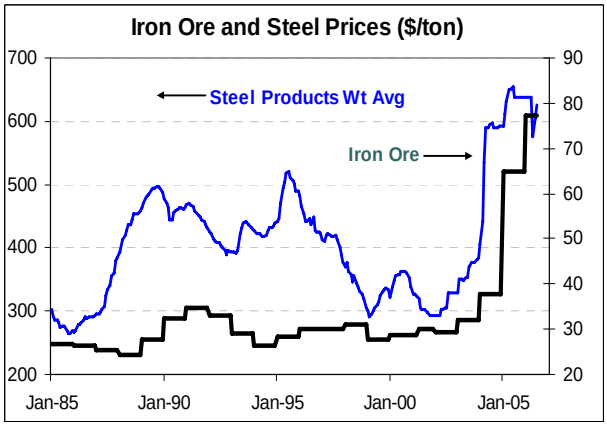
Aluminum prices have risen much less than copper, largely because China is a net exporter of aluminum, as opposed to being a large net importer of copper and other mineral resources. China accounted for nearly two-thirds of the global growth in refined aluminum production between 2000 and 2005, and its share of world refined aluminum output jumped from 11 percent to nearly 25 percent during the five-year period. The government of China has taken steps to limit credit and investment in new aluminum capacity, and the anticipated effect of these measures on the global aluminum balance has partly contributed to the rise in prices in 2006. As the manufacture of aluminum requires vast amounts of electricity, the government also wants to curb the export of scarce, embedded power.

Tin and lead prices have also risen due to strong growth in demand in China. Following the collapse of the international tin agreement in 1985, tin prices plunged and significant production capacity was closed. Prices have risen during the current cycle due to strong demand in China, but prices have not returned to former highs. Prices fell in 2005 due to rising supplies, as tin is the one metal in which production can respond relatively quickly to higher prices because of the large number of small producers in the main producing countries, notably Indonesia. Tin is benefiting from the elimination of lead in solder in

Europe and elsewhere, and tin prices have recently rebounded with the rally in other metals prices. ***Lead*** prices, meanwhile, have risen due to strong battery demand (its main end-use) in China and elsewhere, but prices remain below the nominal highs of the early 1980s. Lead supplies are ample—both from production and recycled scrap—and prospects for new supply to accommodate rising demand are favorable.

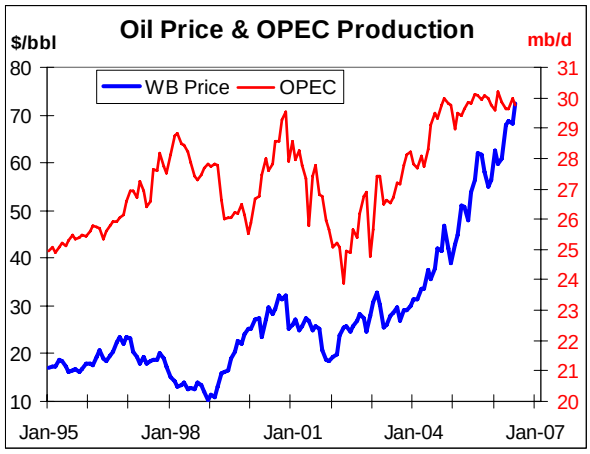


Iron ore prices have more than doubled due to strong demand from steel producers, mainly in China. Steel production in China grew by 22 percent p.a. between 2000 and 2005, and China's iron ore imports grew at a rate of 32 percent. Global ***steel*** production continues to shift to low-cost regions, such as China, and away from higher-cost mature areas. Significant production cuts in these mature areas along with strong demand have helped stabilize steel prices at historically high levels. China's production, which had been running ahead of demand, has also slowed recently. This, along with strong domestic demand, has helped rebalance the Chinese market in 2006. China, which had been a net importer of all steel products, became a net exporter in 2005.



Energy

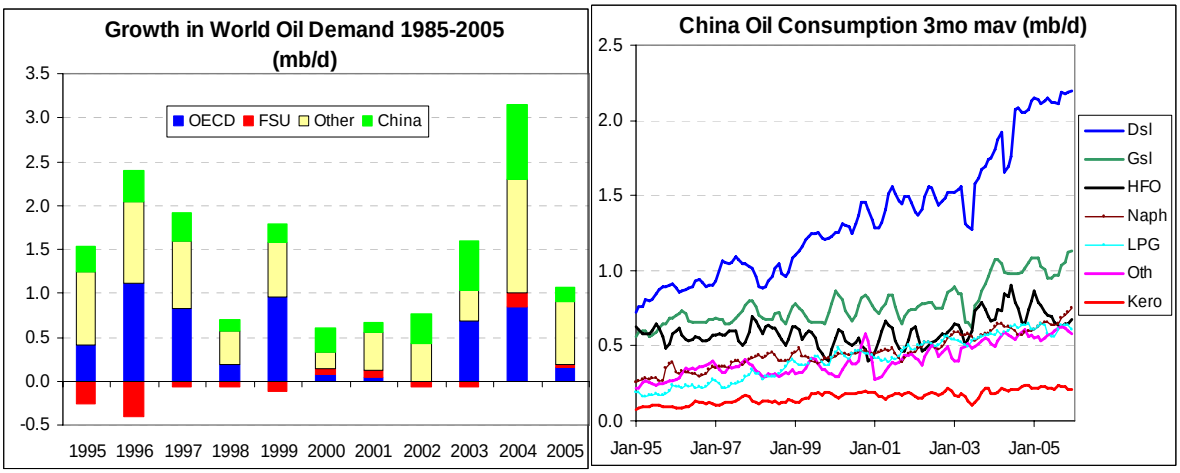
Crude Oil. Crude oil prices have risen to record nominal highs of near $75/bbl[3]. In real terms, prices are below the monthly peak in 1980 of $82.2/bbl. In 1998 oil prices dropped to $10/bbl brought on by OPEC over-production and the slump in demand following the Asian financial crisis. In response OPEC reduced production to raise prices to between $20 and $30/bbl, which were maintained through 2003. However, oil demand soared in 2004 due to strong global economic growth of more than 4 percent



[3] Average of WTI, Brent and Dubai.

and large growth in oil consumption in China and elsewhere. However, China accounted for little more than one-quarter of the growth and was not the single main determinant of higher prices. On the supply side, non-OPEC production growth outside of Russia had been sluggish since the slump in oil prices, and output in Russia—which had provided much of the growth in non-OPEC supply in recent years—began to slow in the wake of the Yukos affair. OPEC began raising production in an attempt to keep the market well supplied and prevent a spike in prices, but by the second half of 2004 OPEC and the entire oil industry was pushed up against capacity constraints—particularly for light crude production—and oil prices soared.

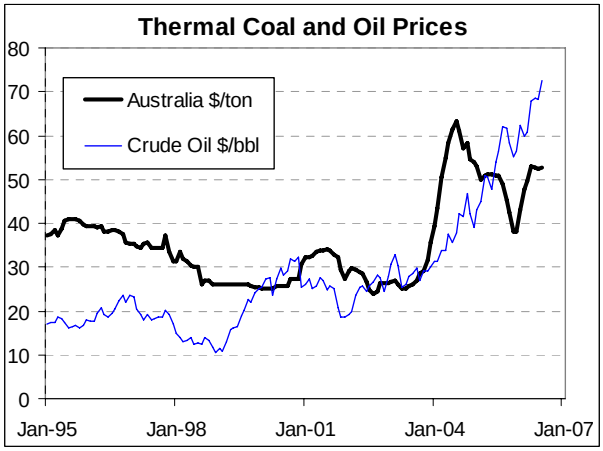
In 2005 and 2006, demand growth slowed and inventories rose, yet prices surged to much higher record nominal levels. Much of the increase was due to actual disruption to oil supplies and fears of further disruption because of limited spare capacity. Hurricanes in the Gulf of Mexico caused oil and gas production to be shut in, and also curtailed refinery operations in the U.S. In addition, production in a number of OPEC countries had slipped from earlier highs, e.g., Iraq, Nigeria, and Venezuela. There continued to be concerns that production could be reduced further in these and other countries, notably Iran, over various geopolitical difficulties. Non-OPEC supply growth continued to struggle to add capacity hindered by technical delays and equipment and labor shortages. Investor expectations—as reflected in futures prices—suggest that the market will remain tight for an extended period because of continued strong growth in demand—led by China, India and the U.S.—coupled with the belief that supply will have difficulty keeping pace.



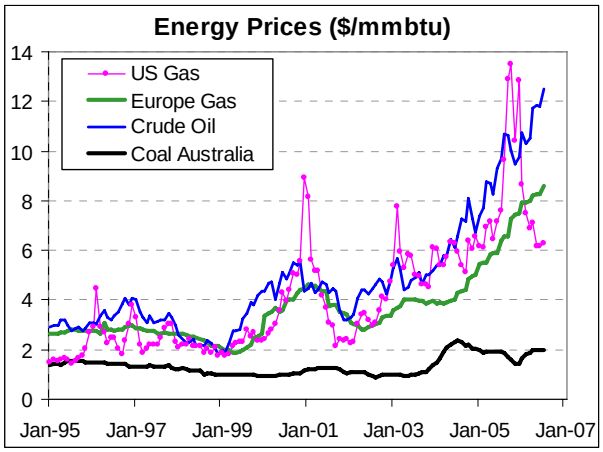
Much of the growth in China's oil demand in 2003 and 2004 was for diesel used in back-up power generators because of chronic power shortages and blackouts. Significant new power capacity is coming on stream, and diesel use in generators is being backed out. For other petroleum products, growth has been more moderate, and was not a significant component of the "explosion" in growth in 2004—although there was a step-up in heavy fuel oil use in power generation, as well as in gasoline consumption.

High prices have already had an impact on demand globally, notably in the reduction of subsidies in a number of oil importing developing countries because of the large financial burden imposed by trying to sustain sharply expanding subsidies. In developed countries,

sales of large, less fuel-efficient vehicles have slumped, and there is greater consumer interest in more fuel-efficient and alternative, hybrid vehicles. Governments are also studying measures to constrain energy consumption, not only because of high prices but also for environmental reasons, including the reduction of green house gases. However, long lead-times are necessary to structurally change the pattern of oil and energy demand. In addition, an increasing share of oil demand growth is occurring in developing countries which are growing rapidly and where incomes are rising. It appears that much higher real prices are needed, relative to the past, to significantly curb global oil demand.



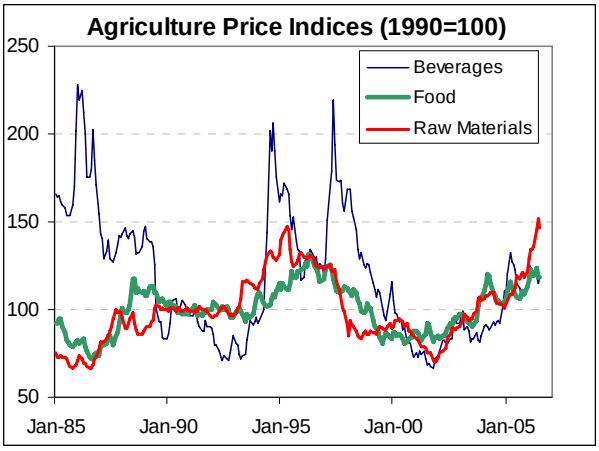
Coal. Coal prices have more than doubled since 2003 because of strong glob al demand and supply constraints in a number of producing countries. Strong global economic growth has increased the demand for power, and the high prices for oil and natural gas have increased the competitiveness of coal. Low and declining prices in the 1990s reduced investment in coal production and export infrastructure. As a result, strong demand in recent years pushed the industry up against capacity constraints. Supply was quicker to respond than other natural resource commodities, because of the abundance of known, low-cost reserves in a number of export-producing countries. Prices fell in 2005 but have risen again in 2006 due to strong global demand, various supply problems and reduced exports from China.



Other energy. High oil prices have also contributed to the rise in other energy prices, notably natural gas, because of competition in under-boiler markets. In addition, contracts for most liquefied natural gas (LNG) shipments and natural gas imported into Europe are linked to oil prices. Rising prices for hydrocarbon fuels have pushed up electricity costs. The appeal of natural gas, which had been the fuel of choice on environmental and economic reasons, has diminished because of its sharply higher prices. China and India have a relatively small share of their primary energy mix supplied by natural gas, at 3 per cent and 7 percent, respectively, much of it domestically produced. However, China and India both have intentions of importing large volumes of natural gas by pipeline and LNG to reduce the share of coal in power and industry. Over time they are likely to become significant importers of natural gas. However, given the abundance of gas resources in the eastern hemisphere and the fact that the gas price will be tied to oil

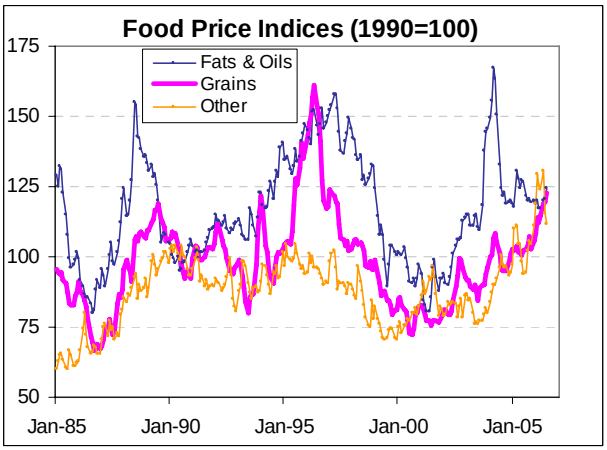
in the foreseeable future, China and India are unlikely to have a large impact on gas markets or gas prices over the next decade.

Agriculture



Agriculture prices have not increased in tandem with oil and metals prices, as markets have been generally well supplied. Most agriculture prices are mainly affected by weather conditions, but other factors can also affect demand and supply patterns. Some individual agriculture prices have increased recently, but nearly all remain well below previous peaks. ***Beverage*** prices have been the most volatile in the past, but supplies are adequate at present, partly due to emergence of relatively new producers, e.g., coffee in Vietnam. Cocoa, coffee and tea prices are all up from their recent lows on various supply problems, e.g., drought in Kenya that has contributed to higher Mombasa tea auction prices.

Raw materials prices have also risen, but this has mainly the result of a sharp rise in rubber prices because of high oil prices which have raised the costs of synthetic rubber, its main competitor. The price of the other main raw-material commodity, cotton, is relatively subdued due to well-supplied markets. China is a major consumer of both commodities, and India is as well but to a smaller degree.

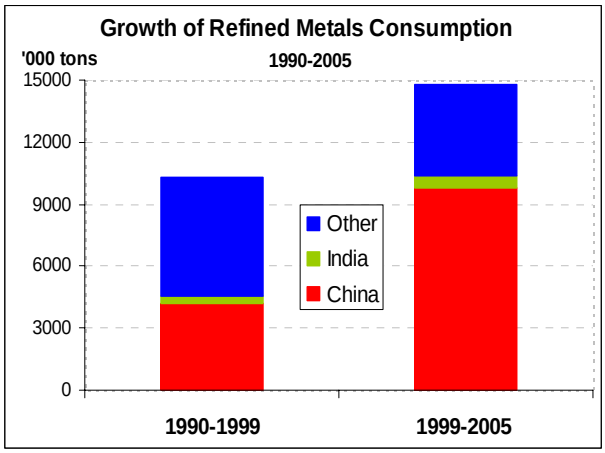


Food prices have risen the past couple of years, mainly for grains and "other" food—notably sugar. 'Fats and oils' prices spiked in 2004, mainly due to drought in Europe and North America, as well as strong demand in China. However prices have since receded with favorable harvests, but remain somewhat elevated along with grains and other food prices. Grains prices have risen in part due to higher prices for fertilizers and other inputs. Sugar prices have surged due to strong demand for ethanol in Brazil and the U.S., which is reducing supplies of cane sugar in Brazil. As agriculture prices move higher, investment funds are reportedly eyeing agriculture commodities as the next sector for commodity-asset investments.

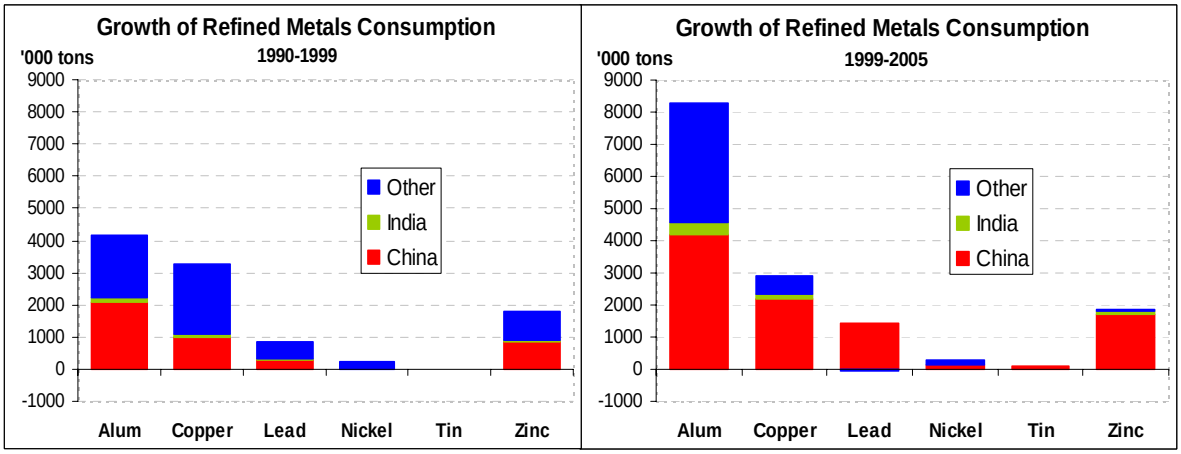
Importance of China and India

Metals

The acceleration of growth of China's metal consumption since 1999 has been a major contributor to the surge in metals prices the last few years. Between 1990 and 1999, China accounted for 41 percent of the growth in main metals consumption, increasing 4.2 mt or 13.2 percent p.a. However, between 1999 and 2005, China accounted for nearly two-thirds of the growth in global demand, as its volume growth more than doubled, increasing by 9.8 mt or 17.0 percent p.a.—in just 2/3 the time of the earlier period.



China's rapid growth in metals demand had a significant impact on the recent rise in metals prices, particularly where China is a large net importer—copper, iron ore, lead, nickel and zinc. It is these metals where prices have increased most. Conversely, even though the largest growth in China's metal demand was for aluminum between 1999 and 2005, China's production of aluminum grew even larger. Its role as a small exporter of aluminum contributed to the relatively weak global price of aluminum.



India has been a much smaller consumer of main metals and did not figure significantly in the recent rapid rise of metals prices. India's growth of total main metals increased from 4.5 percent to 7.0 percent over the two periods noted above, but this was mainly due to the increase in aluminum consumption which rose by 8.0 percent p.a. between 1999 and 2005. The growth of most other metals was lower over this period.

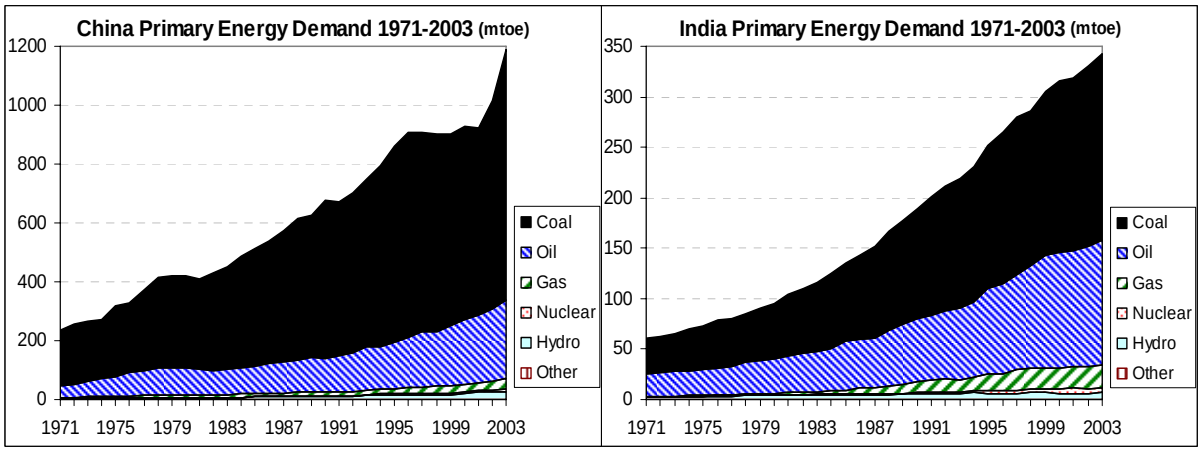
On the supply side, the acceleration of demand growth in China since 1999—and the shear volume of the increase—caught the industry somewhat by surprise, and supplies

have had difficulty keeping pace owing to numerous technical, labor and materials-supply problems. Consequently, future metals prices will not only depend on the pace of demand in China, India, and elsewhere, but also on the development of sufficient new capacity. Importantly, metals prices will also depend on the status of China's position of net importer or exporter.

China also accounted for two-thirds of the growth in global steel production between 1999 and 2005, and its production grew at an average rate of nearly 19 percent. By comparison India accounted for little more than 4 percent of the global growth in steel production, and production growth only rose moderately, at around 8 percent. In the U.S., steel production has declined from its peak output in 2000. The large growth in steel production in China required large volumes of raw material inputs, i.e., iron and coking coal, and its imports have increased sharply.

Energy

China accounted for nearly 30 percent of the net growth in world energy consumption between 1990 and 2003. Much was coal, as China consumed 80 percent of the net global growth in coal consumption over the period—but this includes large declines in Europe, the FSU, and Eastern Europe. Excluding coal, China accounted for 15 percent of the growth in the world's non-coal energy demand, including 28 percent of incremental global oil use. China also accounted for more than one-quarter of the global increase in electricity generation.



India accounted for less than 9 percent of the growth in world energy consumption during 1990-2003. Much of its increase was also for coal, representing 19 percent of the growth in global consumption, about the same volume growth as the U.S. (although India consumes only 7 percent of the world's coal production compared with 21 percent for the U.S. and 33 percent for China). India is becoming a larger net importer of coal, partly because its reserves are of poorer quality coals that generate excessive amounts of ash and other particulate matter. Excluding coal, India accounted for 8 percent of the growth in the world's non-coal energy demand, including 11 percent of incremental global oil use. Although India consumes a much smaller volume of oil than China (2.6 mb/d in 2005 compared with 6.6 mb/d in China, India relies on oil for a greater share of its energy

use. However its average growth of 5 percent is less than China's 7 percent. India also accounted for 7 percent of the global increase in electricity generation.

Oil. China has been a net importer of oil since 1995, and is an important element in the growth of global oil demand. India is also an important and growing oil importing country, but to a lesser degree than China. Global oil demand grew only moderately between 1985 and 2005—1.7 percent p.a.—in part due to improvements in efficiency and substitution to other fuels. Only in 2004 did global oil demand surge by 4 percent or 3.2 mb/d due to exceptionally strong economic growth worldwide. China represented just over one-quarter of the increase (about its typical share) and India just 3 percent (below its normal share). Although rising oil demand pushed the industry up near capacity constraints in 2004, the increase in oil prices—particularly in 2005 and 2006—has been more to do with supply-side issues. These include OPEC production restraint (through 2004), and more recently to disappointing non-OPEC supply growth, disruptions to supply (e.g., Iraq, Nigeria, and the U.S. from hurricanes), and expectations of future supply shortfalls and disruptions, because of various technical and geopolitical factors.

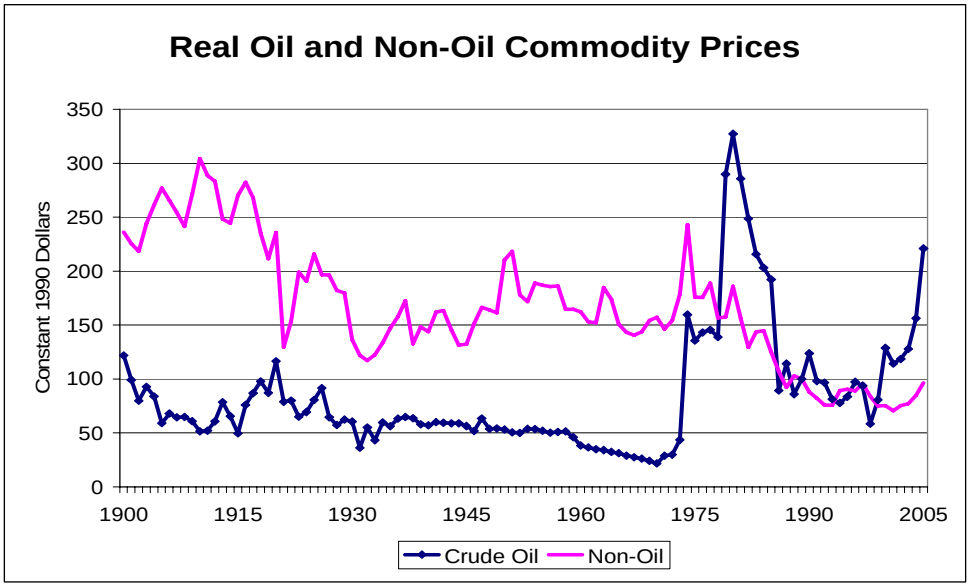
Coal. International coal prices will depend very much on the pace of demand in China and its status as net importer or exporter. India will also play an important role depending on the pace of imports. Ultimately prices will largely depend on how non-Chinese and non-India coal producers either meet rapid import demand growth from these countries, or how they accommodate a possible increase of Chinese exports and stagnant imports into India (a low probability scenario). Both countries are developing other energy sources, e.g., natural gas, hydro, nuclear, and renewables, both to support economic growth and to substitute away from coal and oil where possible.

Agriculture

China and India can have a large impact on prices of agriculture commodities, depending on whether they are a significant net importer or exporter. China is quite self sufficient in grains, and consumption is falling as food preferences change with rising incomes. India is also fairly self-sufficient in most grains, but is a net importer of wheat. China is rapidly increasing consumption of vegetable oils—as is India—and both are large importers of these commodities, especially China. Their growing demand contributed to the drought-led spike in soybean prices in 2004. China is also an importer of cotton, and a large importer of rubber, while India is largely self-sufficient in both. China is a significant exporter only of tea among agricultural commodities, while India is a large exporter of tea, coffee and sugar.

4. Outlook for Commodity Prices

The outlook for commodity prices in the near term is uncertain, partly because of the inherently large volatility of many prices. In the longer term there are questions about the pace of demand in developing countries (particularly China and India), availability and access to supplies, technology developments, production costs, government policies and environmental considerations, including global warming. Real non-oil commodity prices have declined for more than a century (see Figure: represents the trade weighted indices of commodity prices in constant U.S. dollars relative to the manufactures unit value index (MUV[4]). The decline in real non-oil commodity prices from 1900 to 2005 was about 60 percent and the rate of decline was about 1.0 percent per year. Real oil prices have increased relative to 1900, but have been below their 1980 highs through 2005. Following the oil price shocks of the 1970s and 1980s, real oil prices trended downward through 1999, but OPEC production restraint, strong demand, and supply constraints have lifted prices once again.



The World Bank expects non-oil commodity prices to decline after prices peak in the current cycle[5]. However the path will not be smooth, and prices are expected to remain volatile. Supplies are expected to comfortably satisfy demand going forward, assisted by new technologies to help reduce costs. For agriculture prices, medium term risks include higher energy and fertilizer prices, strong demand from rapidly growing developing countries increases, drought in a major producing country, or sharply higher biofuels production. A longer-term concern is the competition between food and fuel as the share of agricultural commodities used for biofuels increases. Prices for metals and oil are expected to decline, but remain somewhat above average prices of the 1990s, due to

[4] Manufactures unit value index (MUV) in U.S. dollar terms of manufactures exported from the G-5 countries weighted by exports to developing countries.

[5] Forecasts published in the World Bank's *Global Development Prospects* and *Global Development Finance* each year.

rising costs. In the case of oil, OPEC production restraint could keep prices well above the costs of production. Resource constraints are not expected over next two decades or into the distant future. Environmental pressures are expected to increasingly restrain demand for energy over the longer term.

With the sharp run-up in oil and metals prices, questions are being raised as to whether this cycle is different, and if prices might remain elevated for an extended period. Strong demand in China and India, supply shortfalls, and rising costs are cited as the main reasons why prices might remain high for these commodities. Rising long-term investment in commodities as an asset class, e.g., from pension funds, are also cited as propping up prices for a lengthy period. However, commodity prices are most likely to remain cyclical and volatile, and not permanently higher.

Metals

Metals prices will ultimately depend on the ability of producers to expand (or reduce) capacity to meet demand. Rapid growth in demand that stretches capacity development will require sufficiently high prices to bring on adequate marginal capacity. Should demand be relatively weak, e.g., from economic recession, prices may have to temporarily fall to levels to shut-in capacity, e.g., operating costs of highest-cost producers. In the long term, prices are assumed to equate to long-run marginal costs (LRMC). There is expected to be a modest increase in the cost curve for most metals in real terms due to rising costs for energy, labor and materials which will remain partially in place when price cycles turn downward. Nickel and iron ore might have the greatest increase in cost curves because of expensive new technology in the case of nickel, and large infrastructure costs in the case of iron ore.

Demand for aluminum is expected to double over the next two decades, and the demand for copper to nearly double over the period. More than half of the growth will be in China and India, with China accounting for half of the growth. Construction is the largest consuming sector for copper (followed by transport and electronics), while the transport sector is the largest consuming sector for aluminum (followed by construction and packaging)[6]. Copper demand is expected to rise for manufacture electronic goods, and for transport, as more electronic features are added to vehicles. Hybrid, electric and fuel cell vehicles could have a significant impact on copper demand as well. Transport is expected to offer the largest growth for aluminum demand that will help reduce weight and improve vehicle efficiency. There are also a number of risks to metals demand, e.g., fibre optics and wireless technologies in telecommunications, plastic tube plumbing in construction, composite materials for jet aircraft, and plastic and glass bottles in packaging.

China, and to a lesser degree India will bring a significant portion of the world's population into the per-capita income range where metals demand accelerates. Much of China's metals demand has been fueled by investment in public infrastructure, manufacturing facilities for domestic and export consumption, and construction. The

[6] Roughly three-quarters of total metal output is consumed in the auto, housing and consumer goods sectors.

Beijing Olympics in 2008 and World Expo in Shanghai in 2010 are expected to sustain metals demand in these two cities until the end of the decade. Beyond the 2010-2015 period, public investment is expected to slow, as is investment in manufacturing facilities, in part due to a stronger banking sector and appreciating currency. Nevertheless domestic demand and exports will remain strong.

China will have a much larger impact than India on metals markets for some time, in part because of India's less rapid development in telecommunications, power and infrastructure. However, the government is taking steps to improve infrastructure and attract foreign investment. Over time, India's demand is expected to accelerate while that of China slows—in part because India's population is expected to grow more quickly than in China. India's economic growth has accelerated recently, and liberalization and reform could raise investment in metals consuming sectors. Beyond India and China, the potential growth for metals demand in the rest of the developing world is vast. With a large population of 3 billion and low per capita consumption, metals demand could grow strongly.

One needs to also consider the long-run growth potential beyond a 20 year forecast horizon of this paper. In the next ten years economic growth could accelerate or falter temporarily, but still be on a long run path of growth. In one long run scenario[7], China is expected to grow rapidly in the near-term, but is overtaken by India next decade, in part because of expected significant ageing of China's population. By 2050, China's economy is expected to be between 94 percent and 143 percent of the U.S. economy, depending on whether it is measured at market exchange rates or PPP, respectively. India's economy is projected to grow between 58 percent and 100 percent, on the same basis. India would be the world's third largest economy at market exchange rates, and tied for second with the U.S. when measured at PPP. On a per capita basis, incomes in China and India in 2050 are 41 percent and 27 percent, respectively, of the size of U.S. per capita incomes in PPP. China might be on par with leading G7 countries today, and India with Spain or Korea, on a PPP basis. The implication is that the potential growth of metals demand in these two countries is very large if metal intensity approaches that of the industrial world.

On the supply side, demand projections indicate that production will have to roughly double for aluminum and copper over the next 20 years. There is significant potential for copper production to expand, led by North and South America. While Canada, Chile and Peru have the largest potential, other countries also have good prospects, e.g., Brazil and Mexico. Australia also has large potential, and Mongolia and the African copper belt (particularly the DR Congo and Zambia) offer the largest potential for new growth.

For aluminum, future additions to capacity additions will be constructed in regions that have low-cost power potential, e.g., remote hydro sites, excess natural gas, or low grade coal that cannot easily reach world markets. Roughly one-third of the operating cost to produce aluminum is power (this varies during the price cycle). The main additions to capacity in the next decade are expected in China, India, Russia, Iceland and the Middle East—the latter three because of low power costs. Projects are also expected in other

[7] PricewaterhouseCoopers, John Hawksworth, "The World in 2050". March 2006.

countries that offer low-cost power from natural gas, e.g., oil producing countries, and from hydropower, e.g., Brazil, Canada, and Norway. In the second decade to 2025, capacity will continue to be developed in regions with a low opportunity cost of power, e.g., a number of oil producing countries. Two regions that will struggle to add capacity are North America and Europe because of higher power costs, environmental regulations, and prohibitive labor costs. China is not expected to be a location for export smelters in the long term because of expected upward pressures on power and labor costs, and appreciation of its currency. As such, it is unlikely that China will be able to compete with Middle East countries that have lower-cost power.

In general, there is no shortage of metal resources over the next two decades and beyond. However, ores are likely to be of lower grade, and new projects will likely be in more difficult locations thereby raising exploration and development costs. This will reinforce the upward shift in long-run marginal prices. Also contributing to this long-run shift will be the need for expensive infrastructure, new processing technology, and the need to confront political risk. High prices and profits will also entice workers to seek higher wages and prod host governments and communities to seek more equitable mineral taxation and benefit sharing arrangements. These can affect development of new projects.

The industry has continued to make strides in reducing costs of mining and smelting operations through technological developments and better management of projects. There have been dramatic expansions in mine capacity, notably in iron ore in Western Australia and Brazil, and copper in Chile. Improved equipment and larger machinery have helped improve economies of scale at these locations. Occasionally major breakthroughs occur, e.g., introduction of leaching technology in the production of copper, attempts to develop inert anode technology in aluminum smelting, and the development of pressure acid leach for the recovery of nickel from laterite deposits. It is expected that the industry will continue to strive to development new technologies to reduce costs.

Petroleum

Some analysts expect oil prices to remain high and possibly continue rising indefinitely due to rising demand in developing countries and the difficulty of oil supplies keeping pace. Even if supply capacity does increase in tandem with oil demand, OPEC is thought likely to restrain production to keep prices relatively high. Others—like the World Bank—expect that high oil prices will impact both demand and supply, and that prices will be pressured lower over time, though not to levels in the 1990s. There are no resource constraints into the distant future, and environmental concerns and new technologies could limit demand growth.

Oil is expected to remain the largest fuel in the energy mix over the next 2 decades and beyond. Unlike the metals industries, world oil demand is only expected to grow by about a third over the next 2 decades according to the IEA[8] and U.S. Department of Energy (DOE)[9], rising by about 25 mb/d or less than 1.5 percent p.a. Developing countries are

[8] International Energy Agency. *World Energy Outlook 2005*.
[9] United States Energy Information Agency. *International Energy Outlook 2006*.

expected to account for the bulk of the increase, with the highest rates of growth in China and India, at near 3 percent according to the IEA. China and India combined will represent less one-third of the growth in world oil demand, and consequently will have a smaller impact on the oil market than in the metals markets. The OECD and Transition Economies together will increase oil consumption about the same as China and India combined in volume terms, but at much smaller rates of growth.

Two-thirds of the growth in oil consumption will occur in the transport sector. Oil will be a marginal fuel in the power sector, with its share falling in every region. Industrial, commercial and residential demand is expected to increase moderately, and most of the growth will be in developing countries, including China and India.

China accounts for a much smaller share of world oil consumption (and production) than for metals and agriculture. This is partly due to the fact that it uses coal to fuel more than two-thirds of its energy needs. India, on the other hand, has a share of world oil consumption that is similar to its share in metals, of roughly 3 percent, although it too uses coal for more than half of its energy needs. China and India's expected share of the growth in oil consumption, at under 30 percent, compares with more than half of the growth in world metals consumption.

World oil supplies are expected to increase commensurably with the increase in oil demand. In the near-term, OPEC production is expected to grow slowly because of known developments and expected increases in such areas as Brazil, Canada, West Africa, Russia and the Caspian. Beyond 2010, there is considerable uncertainty on the path of OPEC and non-OPEC oil supplies. The IEA (2005) projects non-OPEC supplies (including non-conventional oil) to increase slightly beyond 2010 (under real oil price assumptions ranging from $35 to $39/bbl (2004 dollars) over its forecast period to 2030). The U.S. DOE (2006) projects non-OPEC production capacity to increase more rapidly beyond 2010 at a rate of 1.5 percent p.a. (its real oil price assumption has prices declining to $41/bbl in 2014 and rising to $57/bbl (2004 dollars) at the end of its forecast period in 2030). The DOE states that its latest oil price assumption reflects a reassessment of the willingness of oil-rich countries to expand production capacity as aggressively as envisioned in previous outlooks. The difference in OPEC supply projections in 2025 between the IEA and DOE is about 7 mb/d (out of a world oil market of about 110 mb/d).

There a number of risks to the forecast. On the demand side, more rapid growth in oil demand in China, India, and other developing countries—particularly for transport—could put additional strain on oil producers to supply larger volumes of oil. On the other hand, a number of government policies and technology breakthroughs could curb the growth in oil demand. Environmental concerns over pollution, congestion and global emissions could initiate policies to reduce oil use, e.g., carbon taxes and higher CAFE[10] standards. New technologies could reduce oil use in transport, e.g., hybrids, and eventually zero emissions vehicles. While the latter may be some time in future, such prospective developments that would threaten the long-term demand for OPEC oil may persuade oil producers to limit their market power.

[10] Corporate Average Fuel Economy for passenger vehicles and light trucks in the U.S.

On the supply side, there could be much greater production from non-OPEC regions. Historically, projections of non-OPEC supply have been overly pessimistic, in that non-OPEC supplies have been projected to peak imminently and then decline relentlessly. To date that has not occurred, and non-OPEC supplies may again be understated. With the rise in oil prices, there are again increasing claims that "the world running out oil", similar to during the early 1980s when real oil prices were projected to rise "forever". There are a growing number of analysts that believe world oil production will peak during the next decade (2010-2020), and that oil prices must keep rising (see Association for the Study of Peak Oil and Gas[11]). While many analysts and companies (including the World Bank) do not believe that oil supplies will peak during the next decade, should this indeed happen it would have a large impact on China, India and other developing countries. In the extreme, a physical shortfall in oil supply likely means that GDP growth would suffer in the medium term, as there simply would not be sufficient resources to grow. Higher oil prices would be necessary to clear the market, and this would dampen growth.

"Energy security" is gaining fashion, in part because the expected growth in oil supplies will be from more difficult regions. Many countries are off limits to foreign investors, as petroleum sectors are managed by state companies, either wholly or through limited joint ventures. With high oil prices, a series of nationalizations have emerged, e.g., Russia, Venezuela and Bolivia. At the same time, Chinese companies have been scouring the world buying up oil and other natural resource assets in order to secure supplies. However, this does not mean that these supplies will be completely secure, and in any case will not be much cheaper than purchasing on the open market.

Conclusion

Commodity prices are inherently volatile and cyclical. The surge in demand in China, particularly for metals, caught the industry by surprise, and the current price cycles for metals and petroleum are expected to be higher and longer than previously envisaged. There have been temporary factors that have restrained investments in new capacity and delayed new projects, namely shortage of skilled labor and equipment, higher wage demand and strikes, and higher prices for energy and materials. Increases in capacity in both industries are underway which will bring markets back into balance in the next year or two and lead to declines in prices, though not to levels of the 1990s. Higher prices for energy, materials and wages are expected to contribute to higher costs in future, augmented by increasing costs of new developments in more difficult regions. These will be partly offset by development of new technologies. A shortage of resources over the coming decades and beyond is not anticipated. China, India and other developing countries have the potential to absorb higher demand for metals and petroleum than forecast, and this would increase the strain on the respective industries to develop new supplies. However, prices are expected to be cyclical, and not become permanently higher at anywhere near recent price levels. Oil markets have the added element of OPEC production restraint to lift prices well above the cost of production, as occurred in the

[11] http://www.peakoil.net/

early 1980s. However, too high prices could again impact demand and supply and ultimately result in lower prices.

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ANNEX

1. Metals Consumption 1992-2005 - Select Countries
2. Metals Consumption, Steel Production, Iron Ore Imports 1992-2005 – Select Countries
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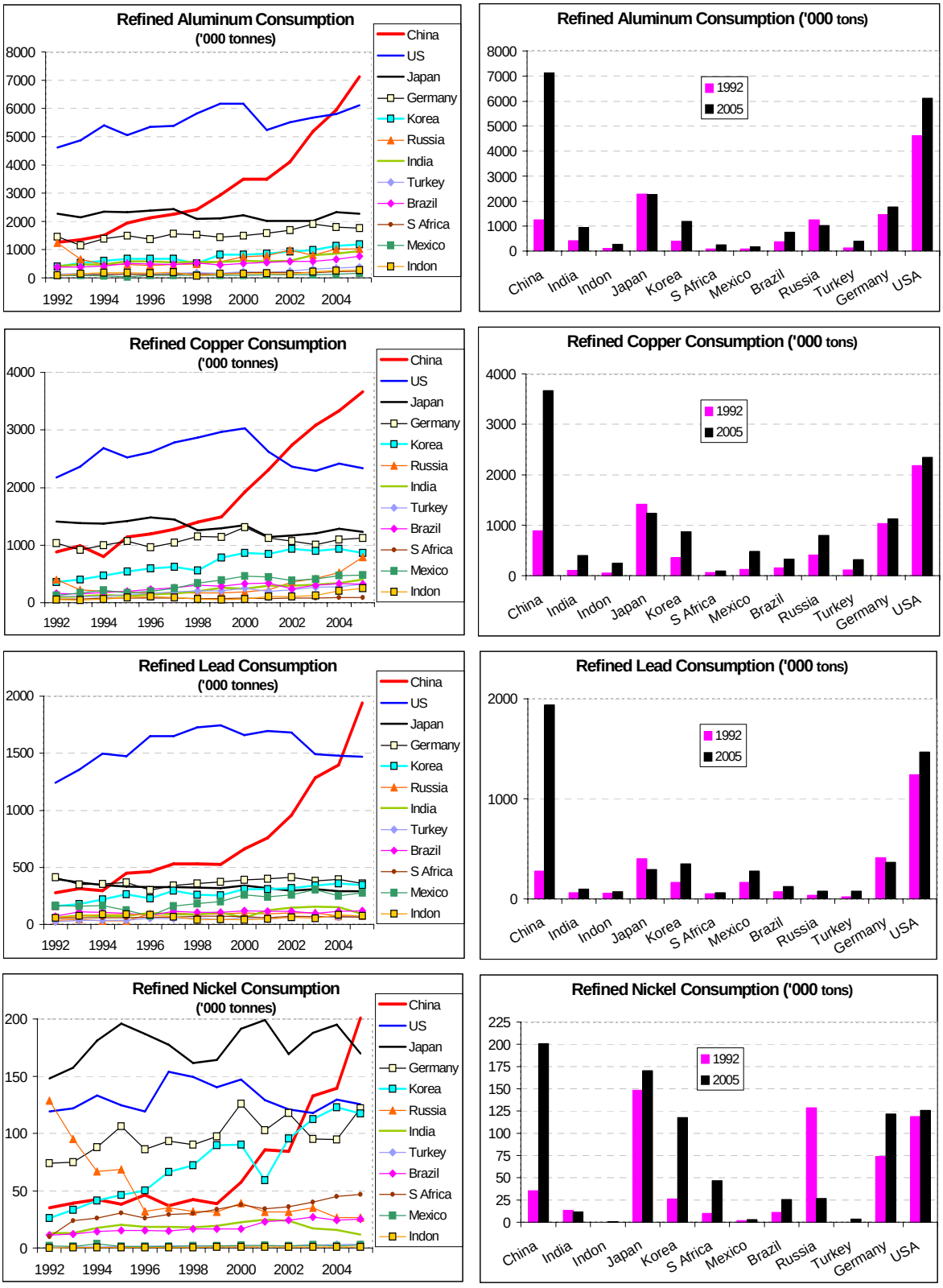
12. Agriculture Consumption per GDP (PPP) and Per Capita (3) 1992-2003 – Select Countries

1. Metals Consumption 1992-2003 - Select Countries



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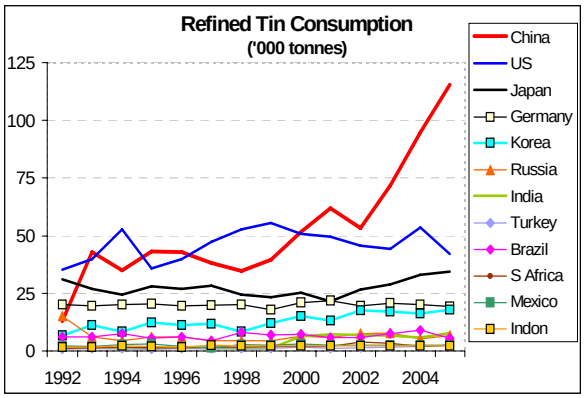
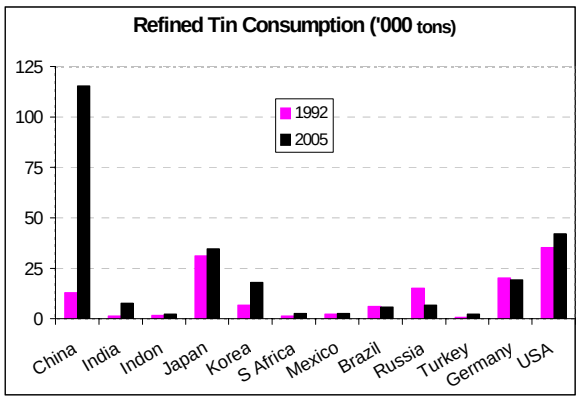
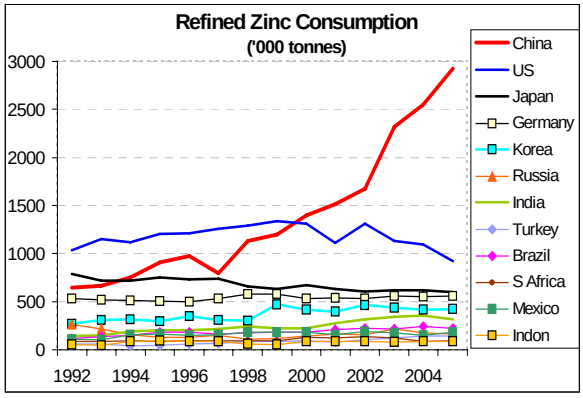
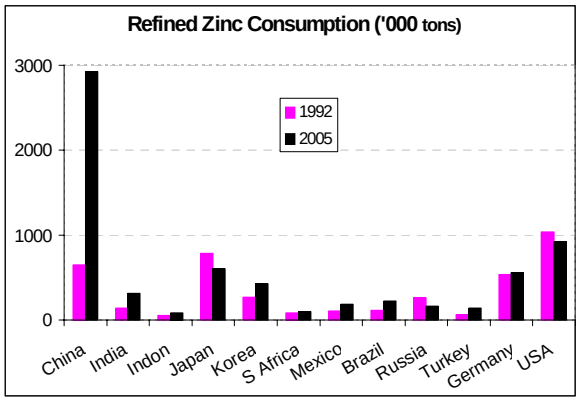
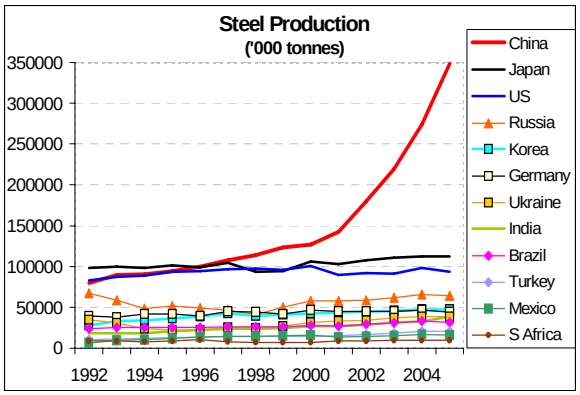
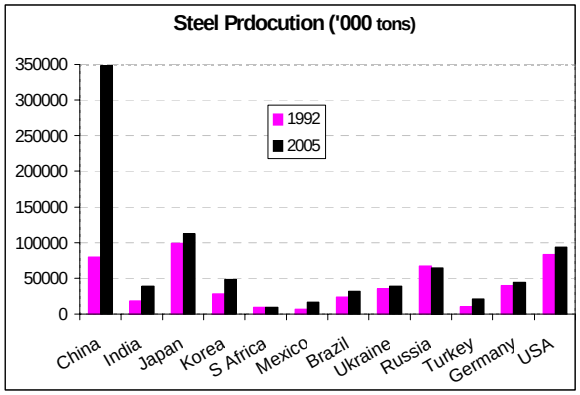


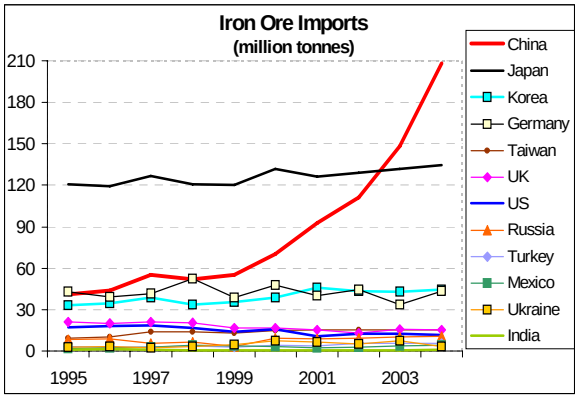


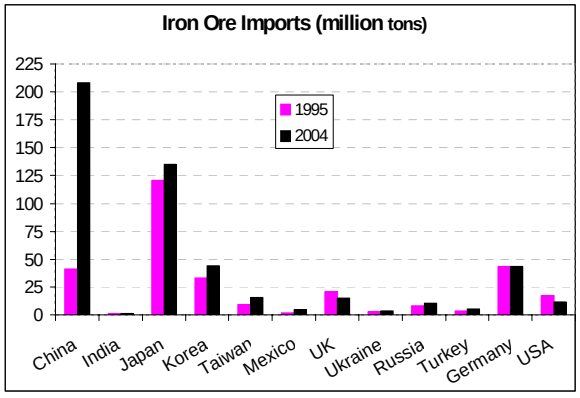






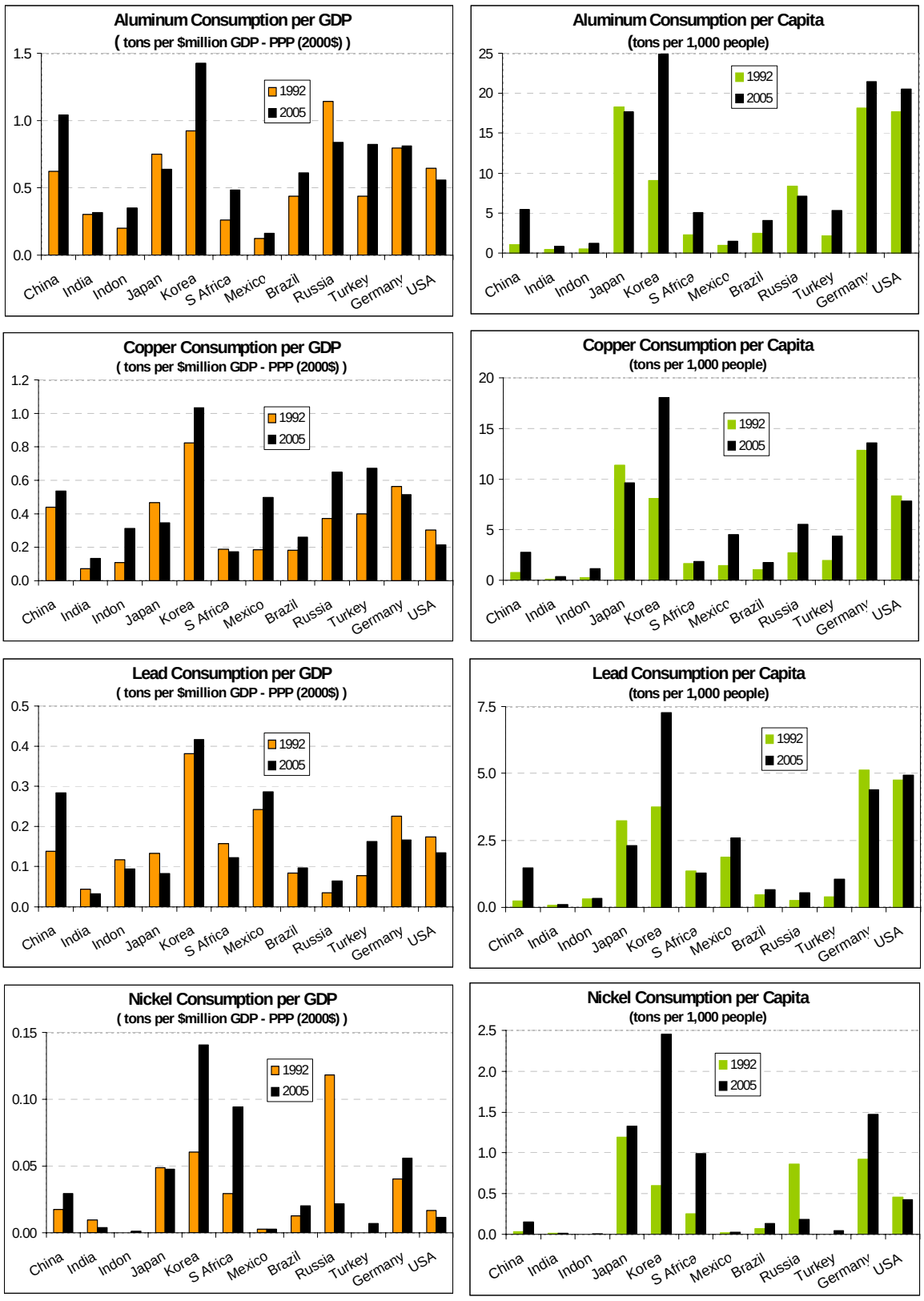






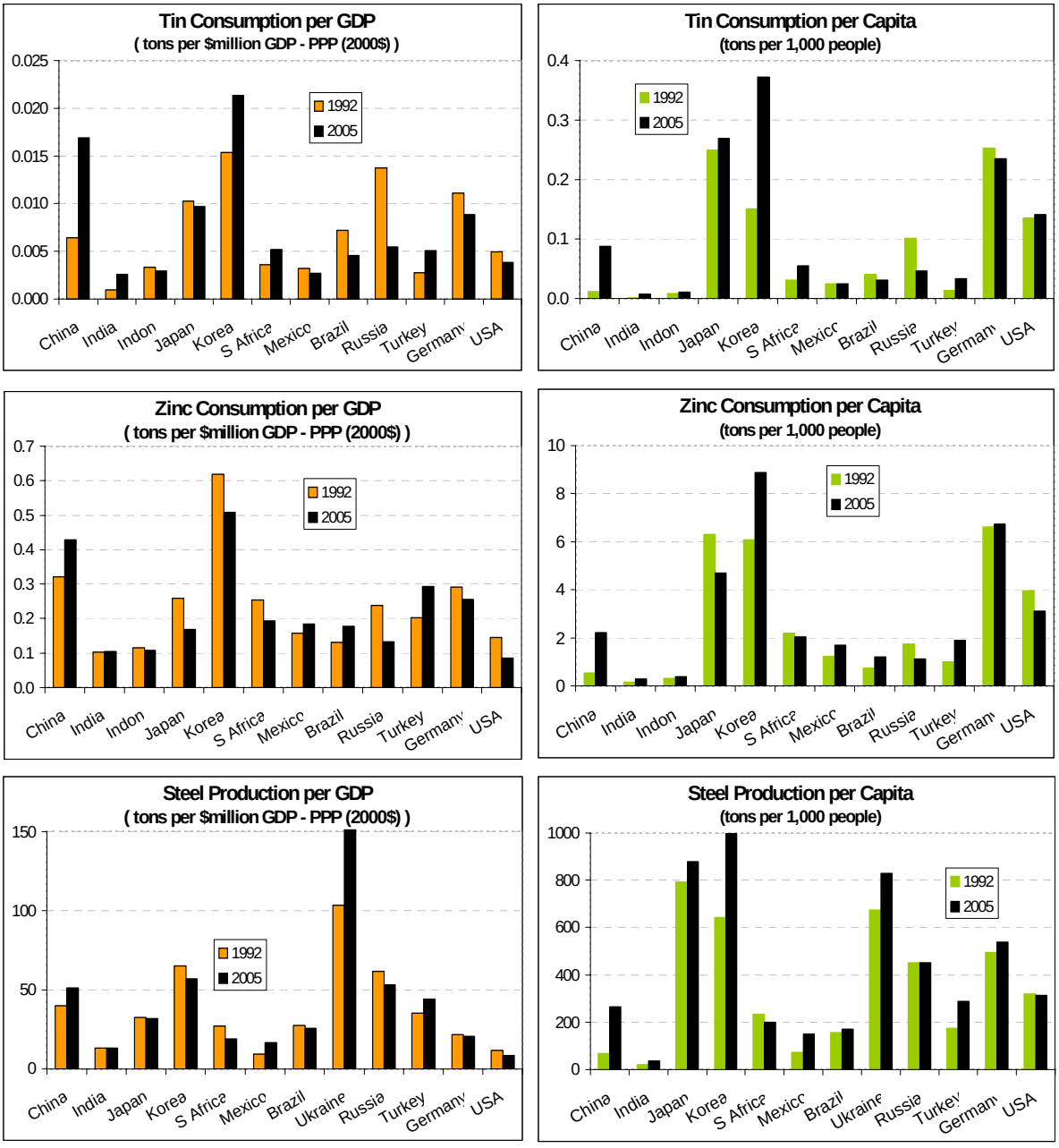
Source: *World Bureau of Metals Statistics*

3. Metals Consumption per GDP (PPP) and Per Capita – Select Countries



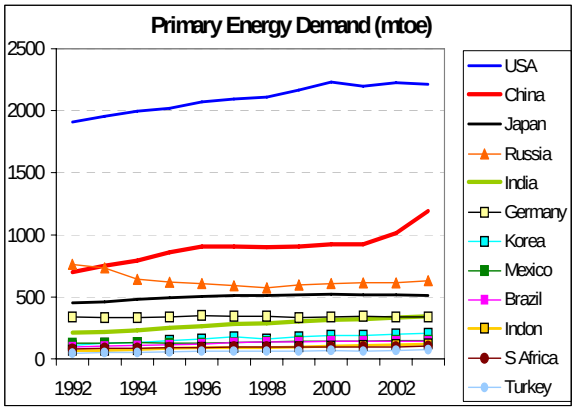
Source: *World Bureau of Metals Statistics* **,** *World Bank.*

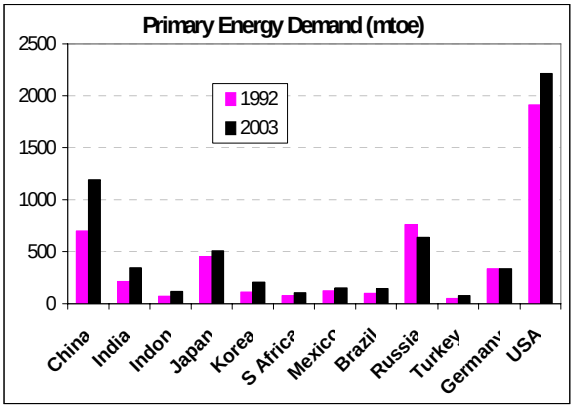
4. Metals Consumption and Steel Production Per GDP (PPP) and Per Capita

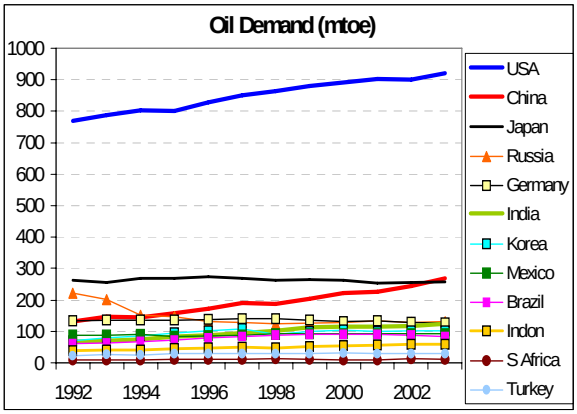


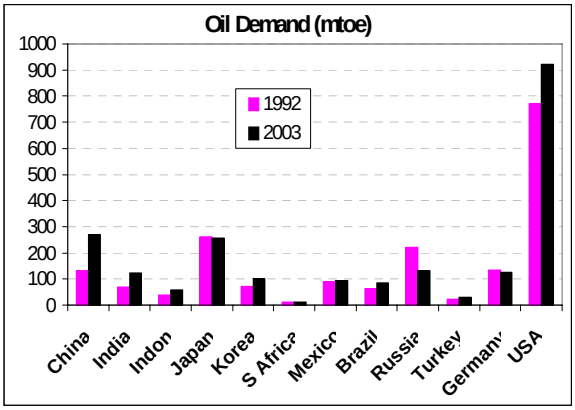
Source: *World Bureau of Metals Statistics* , *World Bank.*

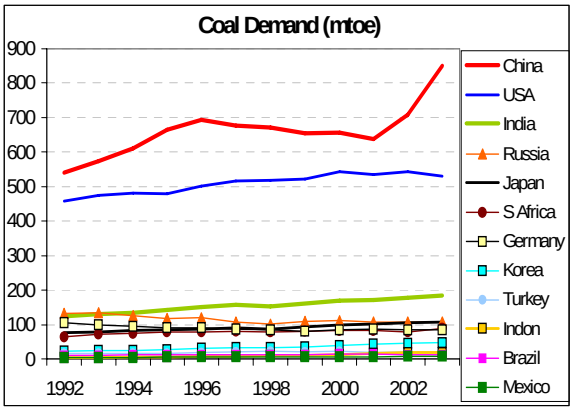
5. Energy Consumption 1992-2003 – Select Countries

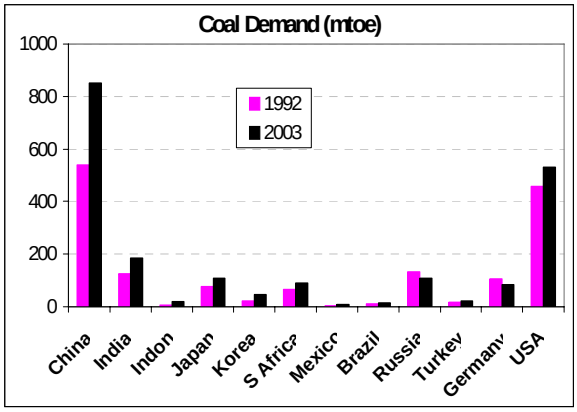












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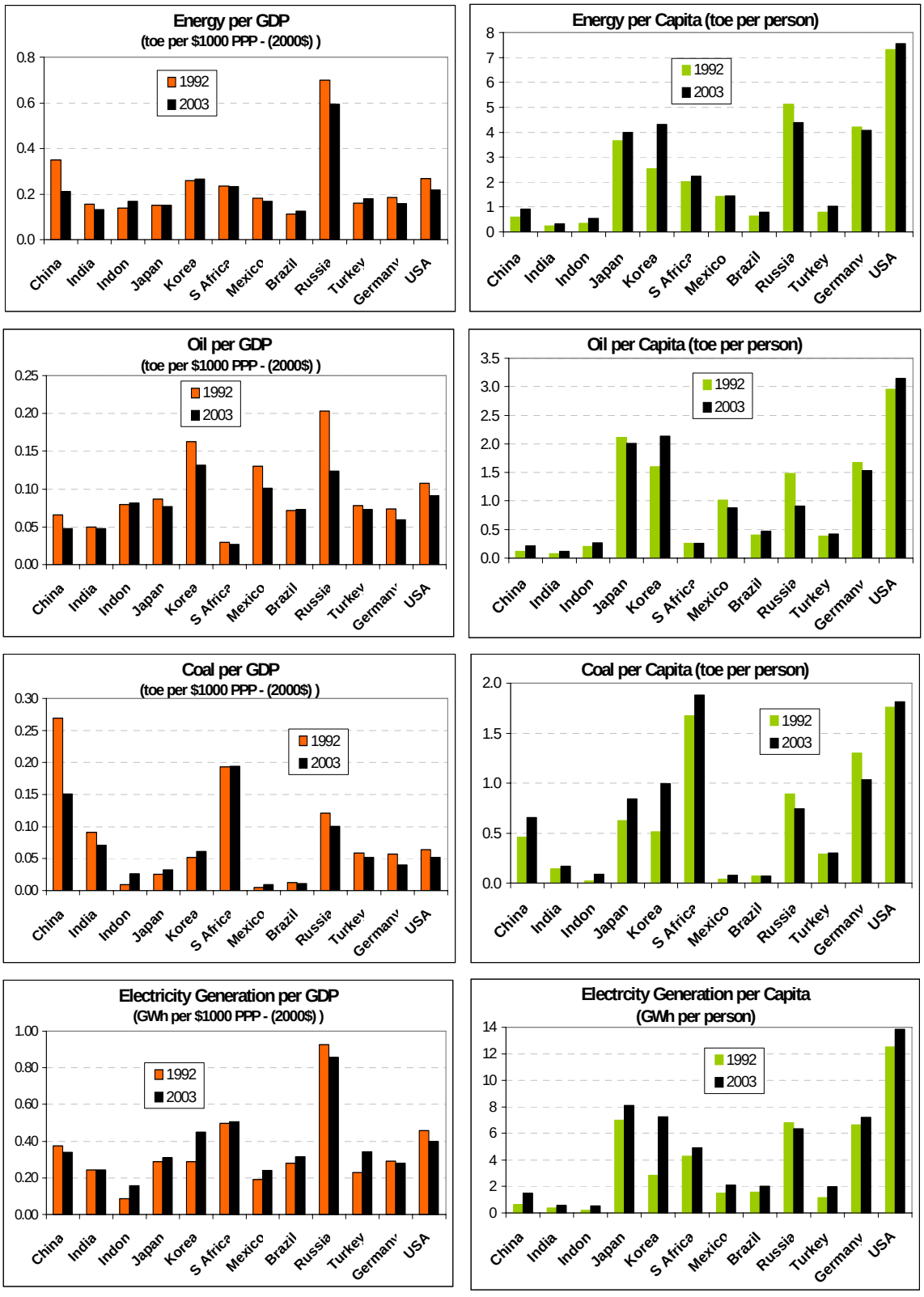
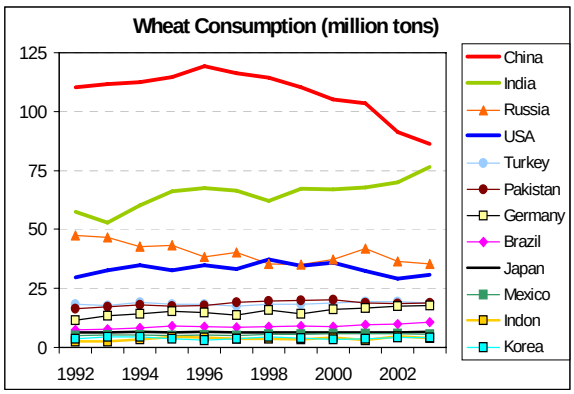
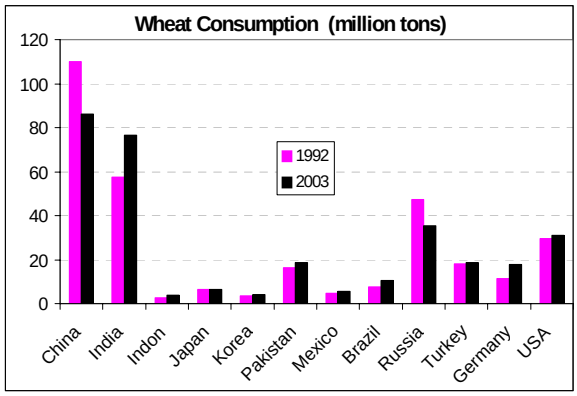
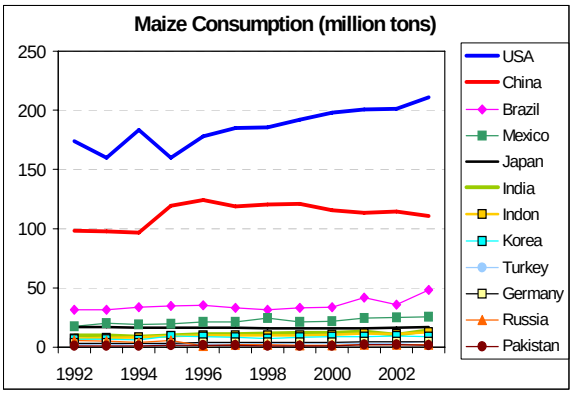


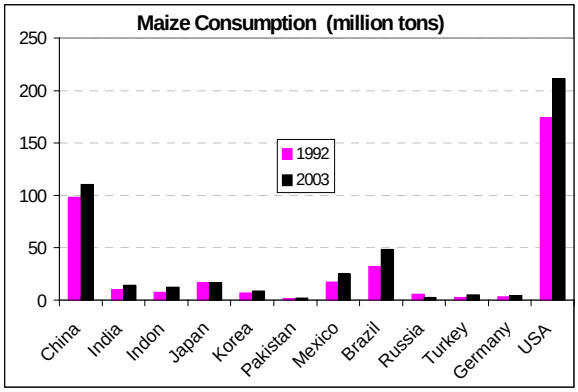
Source: *International Energy Agency and World Bank.*

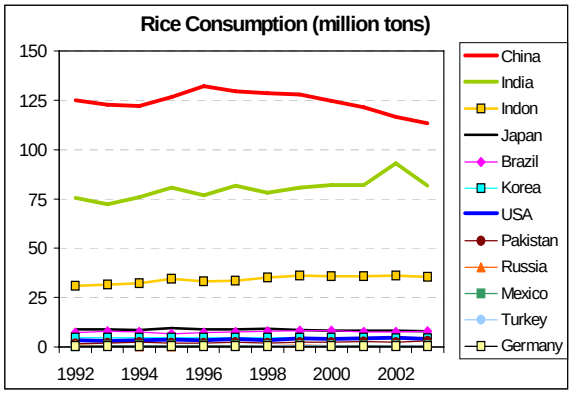
7. Agriculture Consumption (1) 1992-2003 - Select Countries

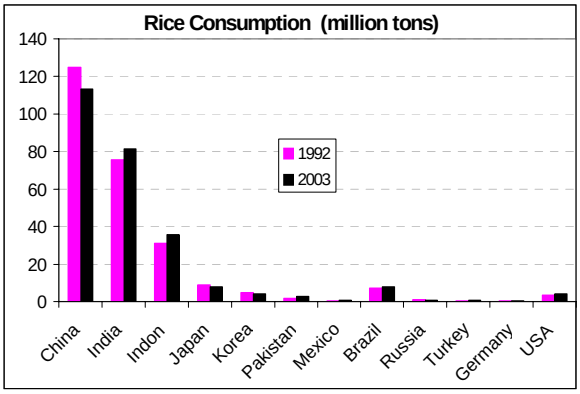


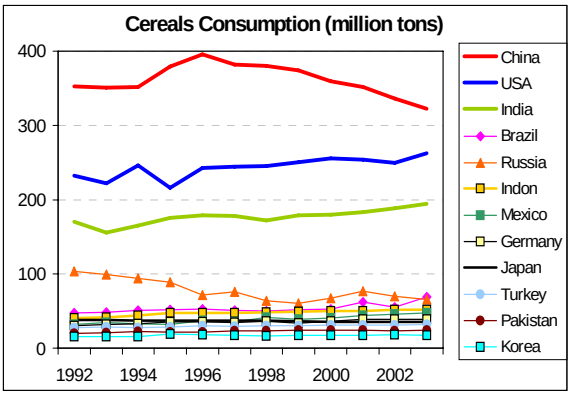


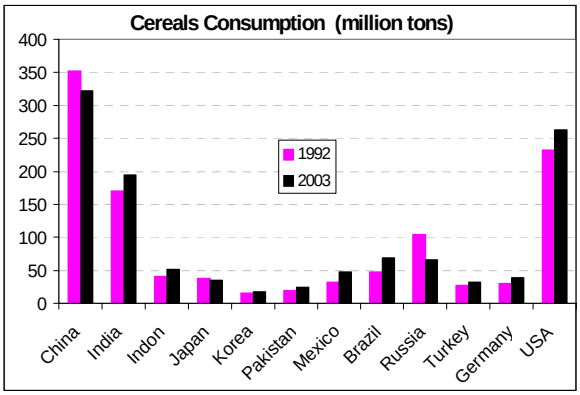






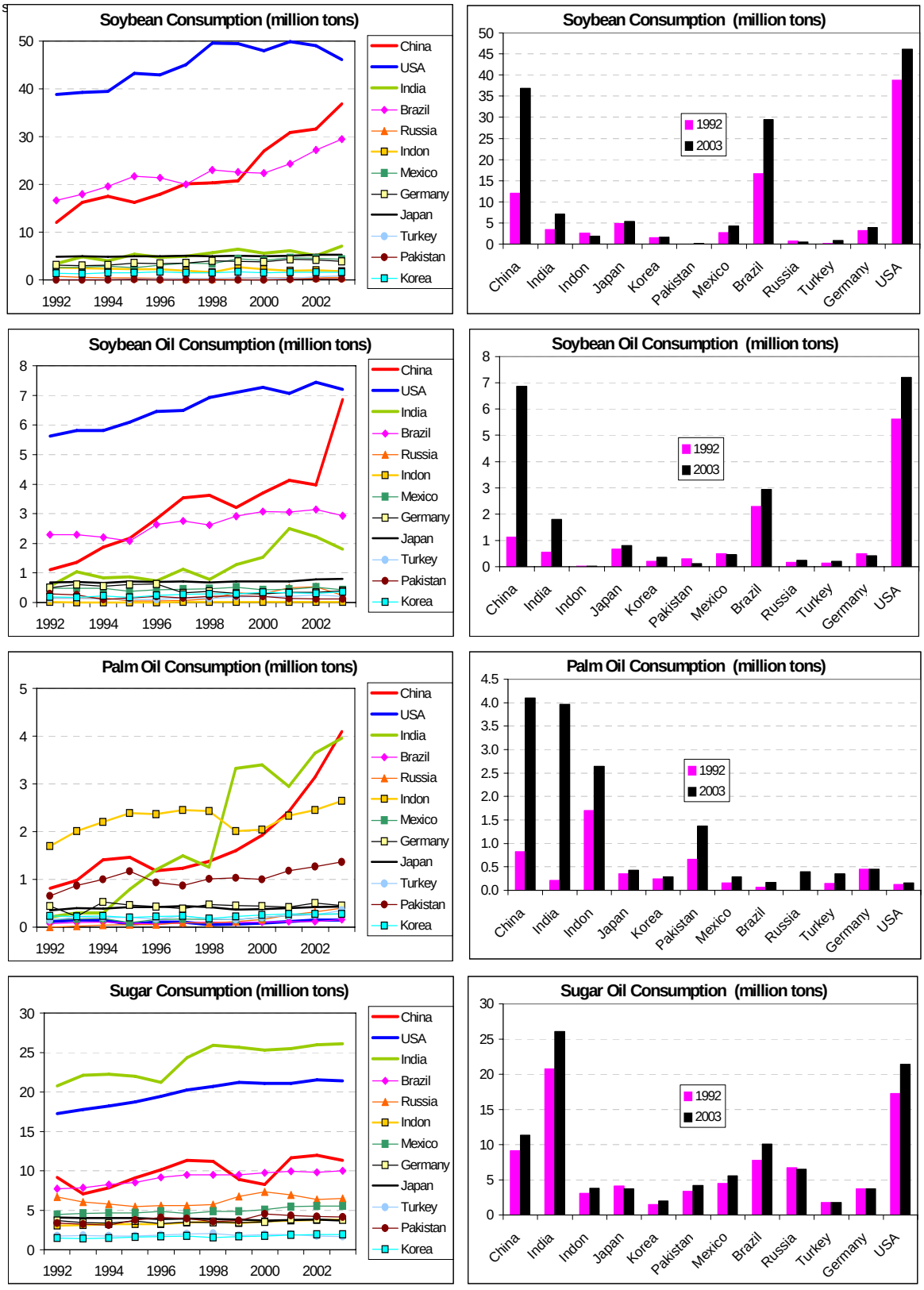






Source: *Food and Agriculture Organization.*

7. Agriculture Consumption (2) 1992-2003 - Select Countries



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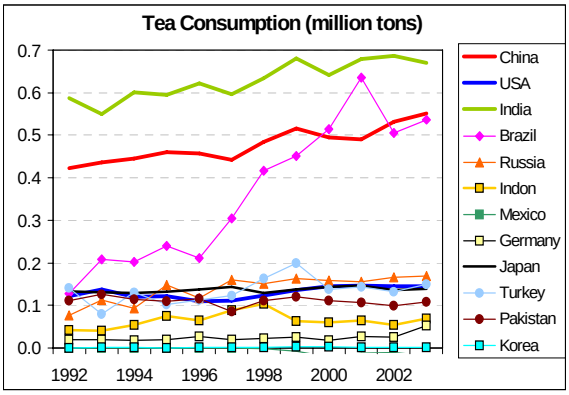

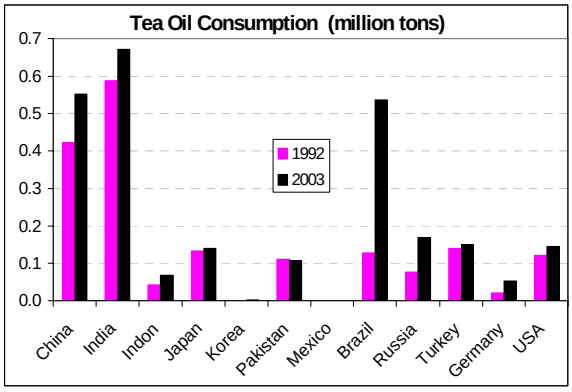

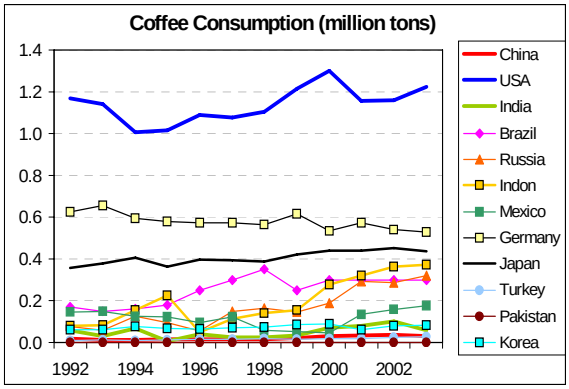

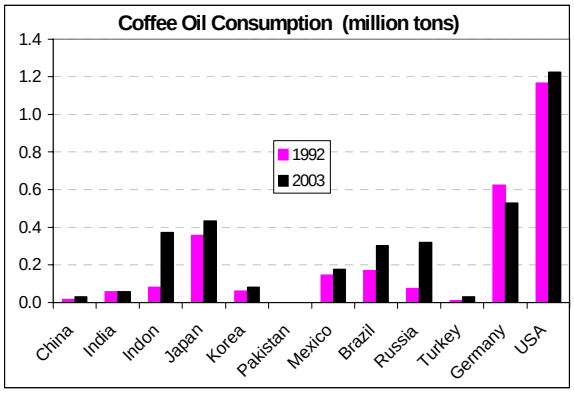

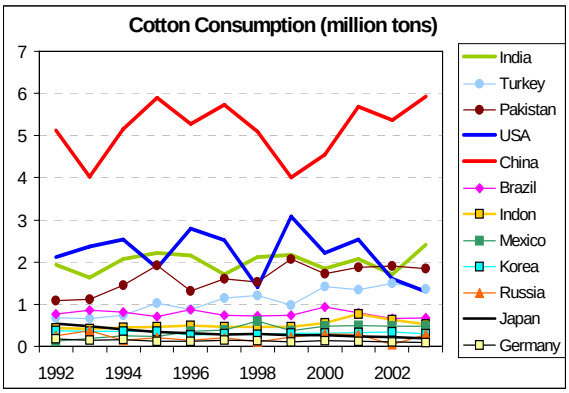

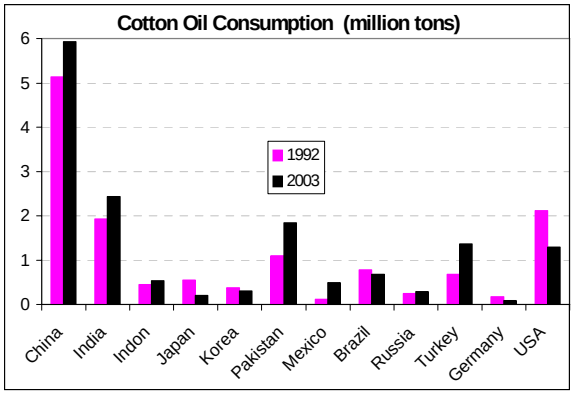

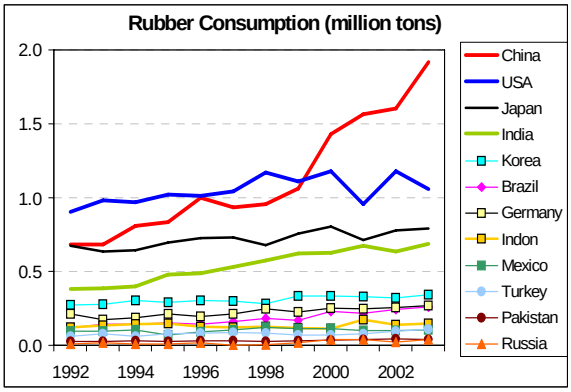

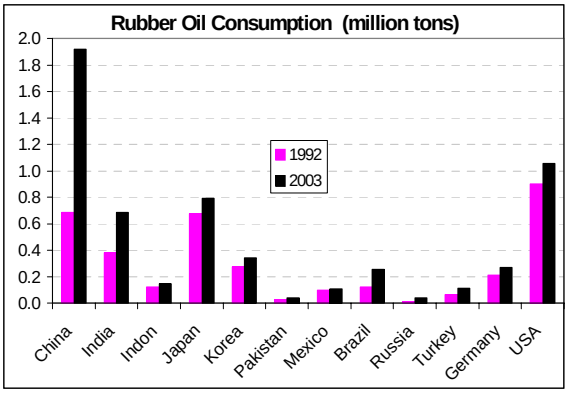

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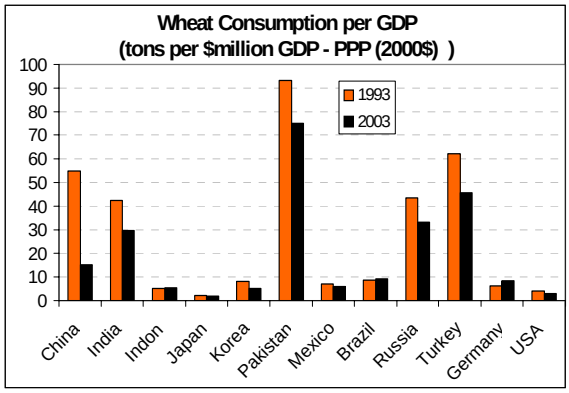
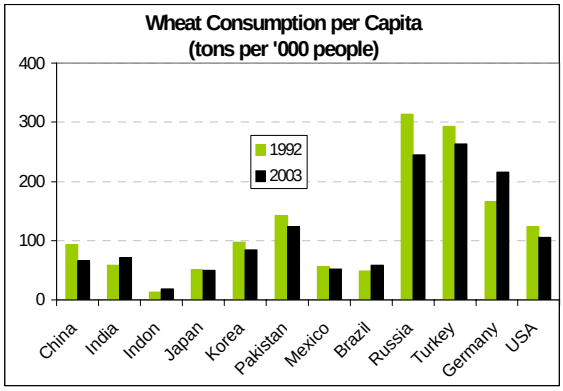
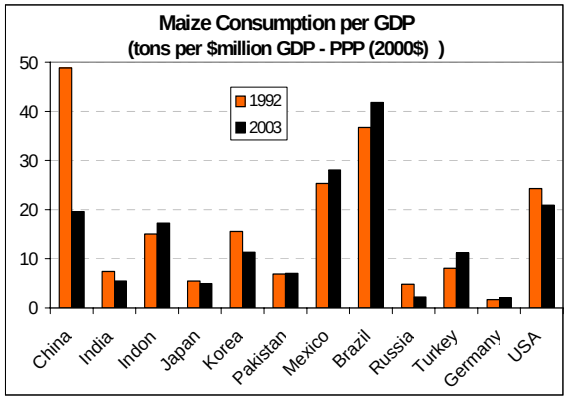
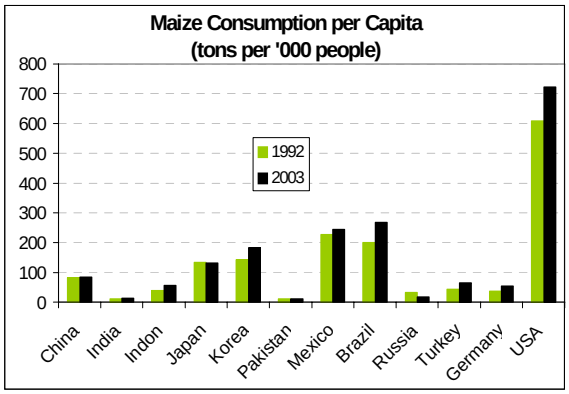
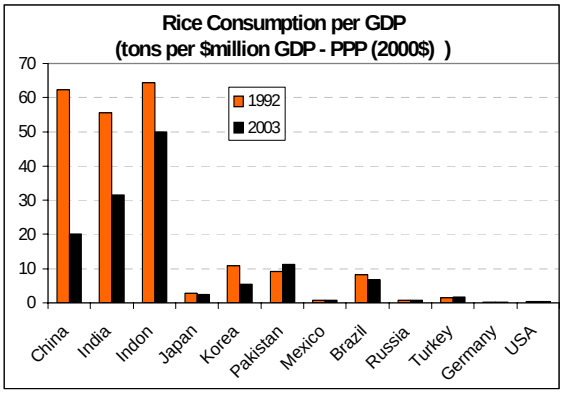
10. Agriculture Consumption Per GDP (PPP) and Per Capita (1) – Select Countries

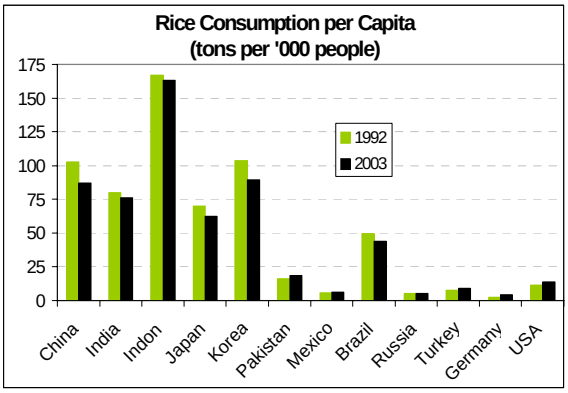


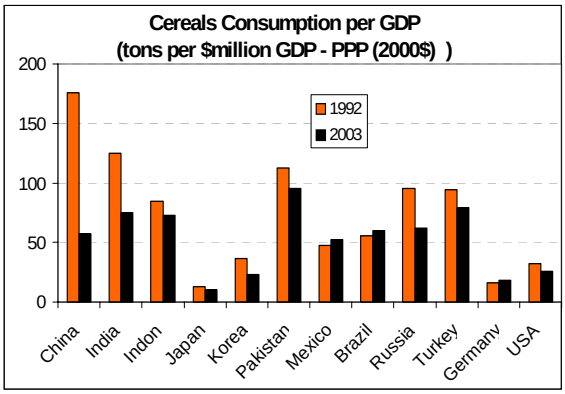


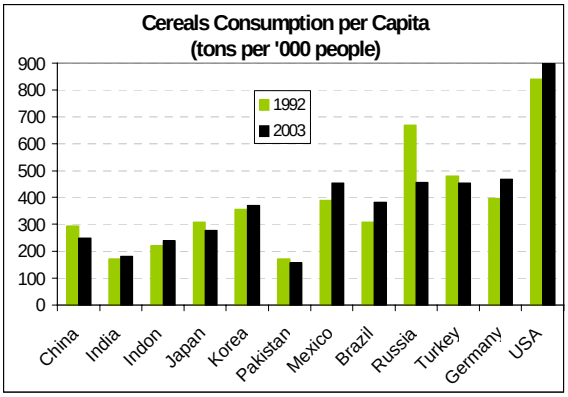






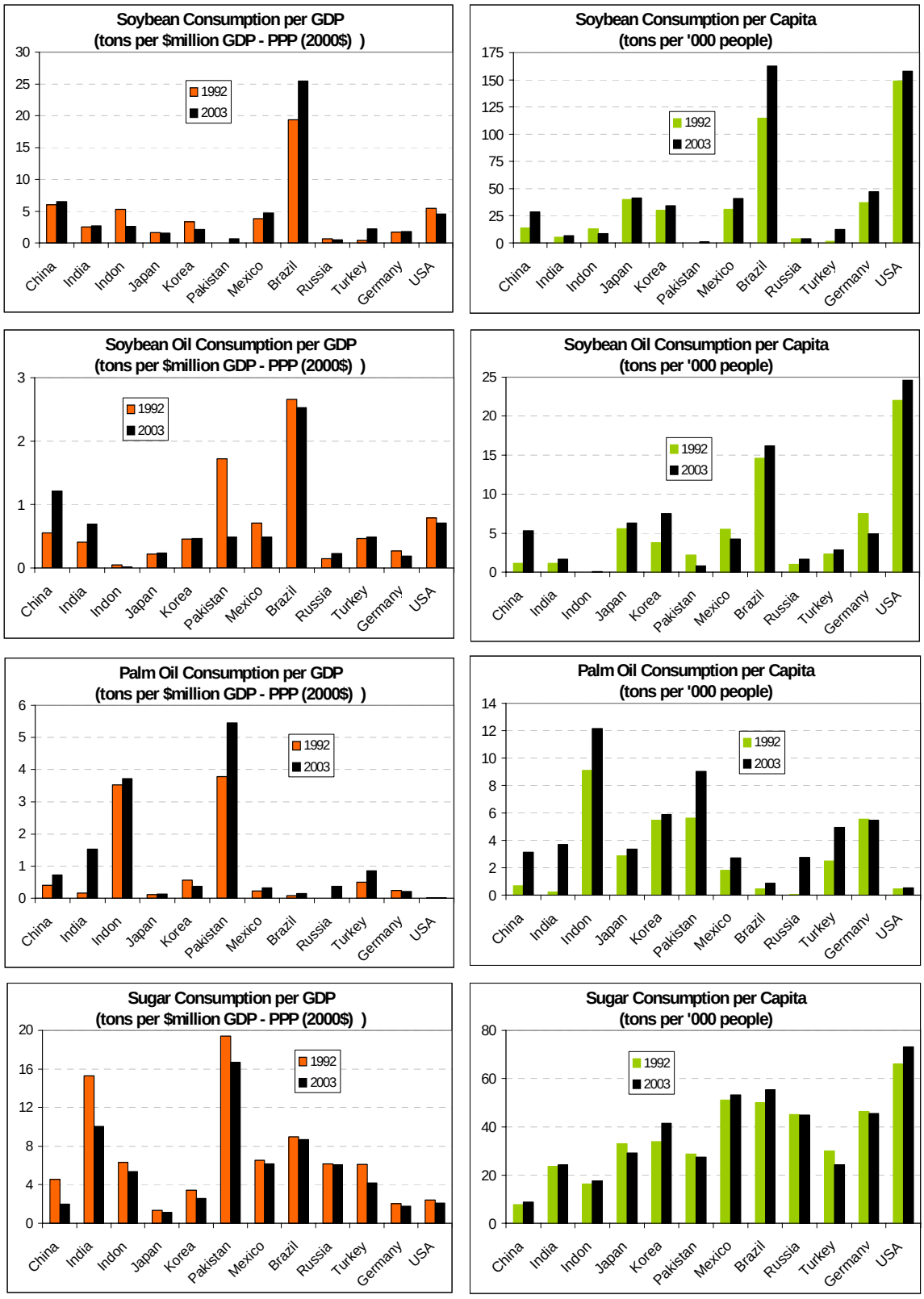






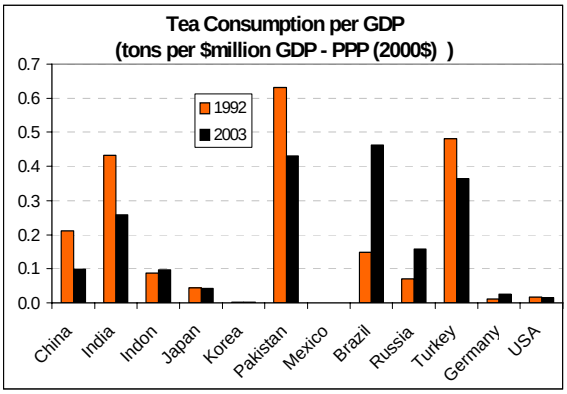
Source: *Food and Agriculture Organization and World Bank.*

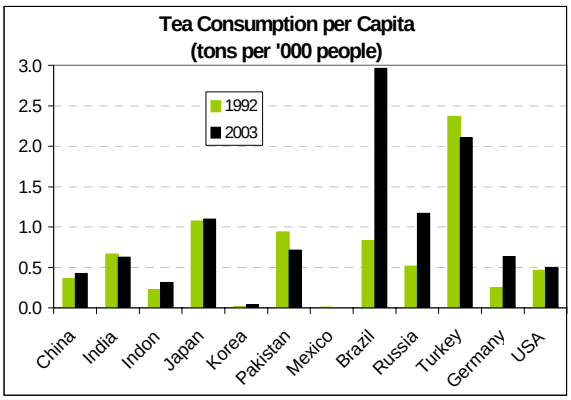
11. Agriculture Consumption Per GDP (PPP) and Per Capita (2) – Select Countries

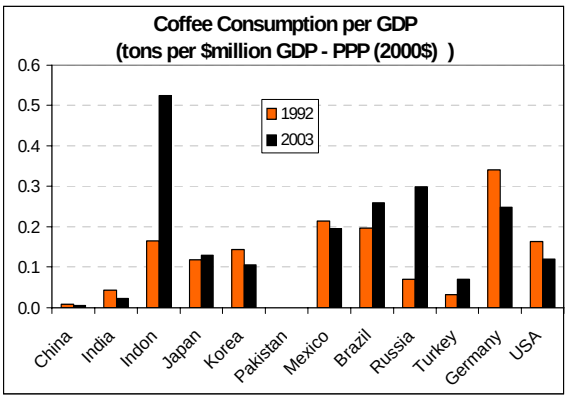


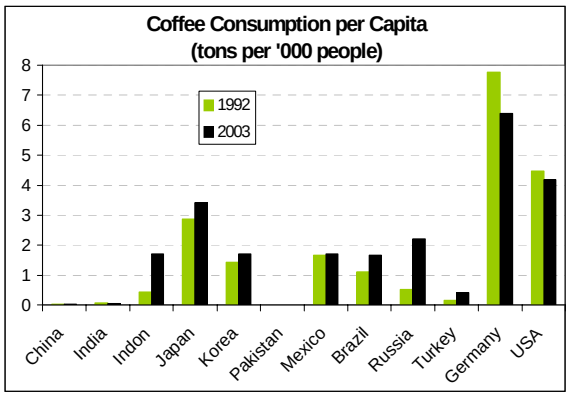
Source: *Food and Agriculture Organization and World Bank.*

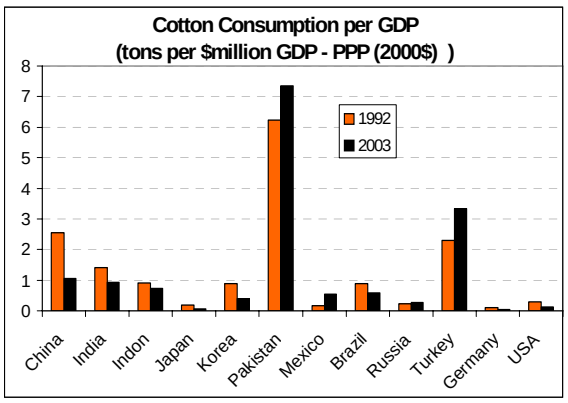
12. Agriculture Consumption Per GDP (PPP) and Per Capita (3) – Select Countries

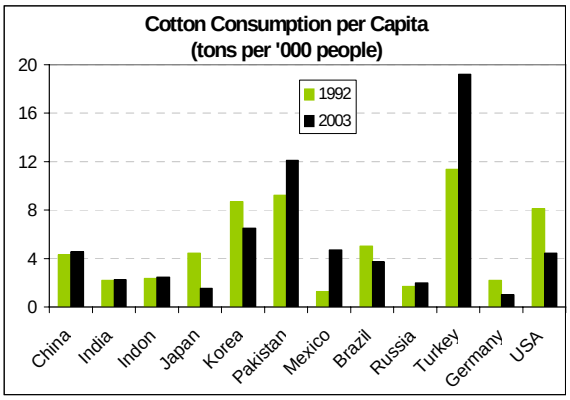


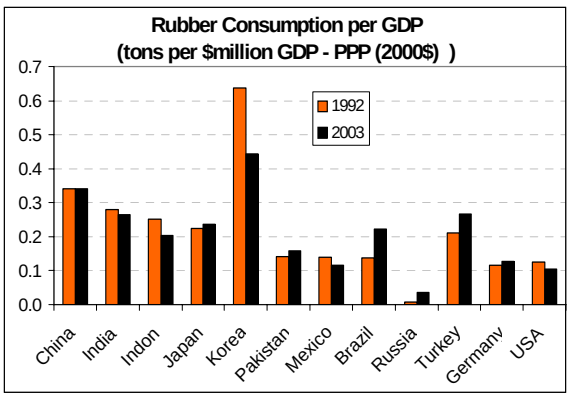


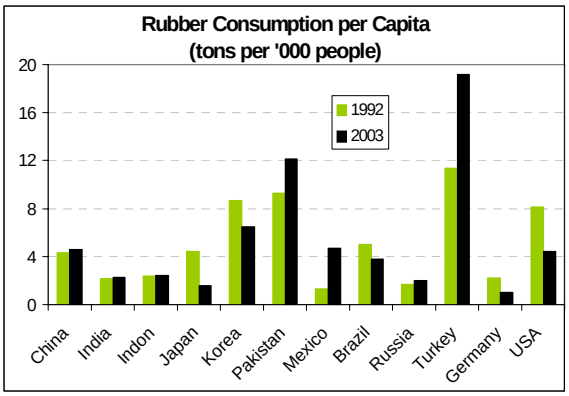












Source: *Food and Agriculture Organization and World Bank.*