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*Recent global growth rates are unprecedented in economic history.*

*Economic growth at this pace will put predictable strains on resources.*

*Population, productivity, economic growth, and production capacity point to long-term commodity gains.*

## Investment Commentary

*"...It takes a long time to recognize a change in a long-term trend"*  
--Alan Blinder

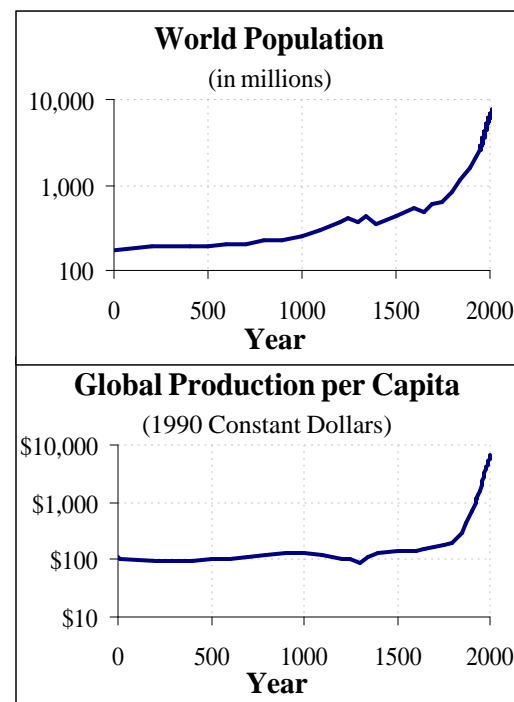
### Global growth is very strong

At 6.6% for 2005, growth among developing economies is at the highest level of any time in the past 30 years<sup>1</sup>. China is leading the way with growth of 9.5%. Both India and Russia grew by around 7%. Growth in the developed world was also robust, expanding by more than 5.5%.

**Some economic growth can be attributed to population growth.** Population growth has accelerated to its fastest rate in recorded history<sup>2</sup>, and more people means more production. Some predict that we are approaching an inflection point, where population growth will begin to slow and stabilize at a sustainable level.

However population is not sufficient to explain high economic growth rates. **Productivity per person has also risen to historic levels.**

Recent productivity is also unprecedented in economic history. The chart to the right demonstrates that productivity growth began accelerating in the industrial age and has continued to increase<sup>3</sup>.



Both of these charts use logarithmic scales, so a constant growth rate would produce a straight line.

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<sup>1</sup> "Global growth" 2005; The World Bank Group

<sup>2</sup> "Historical Estimates of World Population" 2005; U.S. Census Bureau, Population Division, International Programs Center

<sup>3</sup> "Estimating World GDP, One Million B.C. - Present" 1998; J. Bradford DeLong, Department of Economics, U.C. Berkeley

There are several reasons for this new rapid growth:

1. Improving industrial equipment increases the level of production and efficiency.
2. The information age is enabling rapid transfer of knowledge and growth in productivity.
3. International trade since the end of WWII has allowed resources and production to be used more efficiently than ever before.
4. Political reforms since 1989 have brought more than 4 billion people (almost 2/3 of the world population) into market-driven global economies.

### Global growth is increasingly diverse and stable

Global growth is now distributed broadly across many countries, rather than being concentrated within the US, Europe, and Japan. Also, growth in many parts of the world is not relying on innovation per se, but rather adoption of productive tools and technologies already in place in developed nations. Governments are allowing free market economies to develop, and these markets grow faster and are more resilient than state-controlled or centrally planned economies.

Productive innovations cannot be un-invented, and there is little chance that the scope of global communications will decrease. There are political risks to world trade and free markets, but the recent global trend is certainly toward freedom and trade rather than totalitarianism and protectionism.

The World Trade Organization, founded in 1995 to replace the General Agreement on Tariffs and Trade of 1947, now includes 146 member states.

Global economic growth will likely continue at about its present rapid pace for the remainder of this decade, and probably decades after. It may even increase from these rates; Chinese industrial production in May was reported to have grown at 16.6%.

**Continued rapid economic growth will put predictable strains on resources and the environment.** Specifically, countries will increasingly consume like their more-developed neighbors, adding to demand for commodities such as energy, agricultural products, and industrial metals.

<b>Population-weighted Growth* 6.53%</b>		
<b>Country</b>	<b>Population (Millions)</b>	<b>GDP Growth</b>
China	1,299	9.1%
India	1,065	6.2%
United States	293	4.4%
Indonesia	238	4.9%
Brazil	184	5.1%
Pakistan	159	6.1%
Russia	144	6.7%
Bangladesh	141	4.9%
Nigeria	137	6.2%
Japan	127	2.9%
Mexico	105	4.1%
Philippines	86	5.9%
Vietnam	83	7.7%
Germany	82	1.7%
Egypt	76	4.5%
Turkey	69	8.2%
Ethiopia	68	11.6%
Iran	68	6.3%
Thailand	65	6.1%
France	60	2.1%
United Kingdom	60	3.2%
D.R. of Congo	58	7.5%
Italy	58	1.3%
Korea, South	49	4.6%
Ukraine	48	12.0%
Burma	43	-1.3%
South Africa	43	3.5%
Colombia	42	3.6%
Spain	40	2.6%
Sudan	39	6.4%
Argentina	39	8.3%
Poland	39	5.6%
Tanzania	37	5.8%
Canada	33	2.4%
Morocco	32	4.4%
Algeria	32	6.1%
Kenya	32	2.2%
Afghanistan	29	7.5%
Peru	28	4.5%
Nepal	27	3.0%
Uzbekistan	26	4.4%
Uganda	26	5.0%
Saudi Arabia	26	5.0%
Iraq	25	52.3%
Venezuela	25	16.8%
Malaysia	24	7.1%
Taiwan	23	6.0%
North Korea	23	1.0%
Romania	22	8.1%
Ghana	21	5.4%

\* Based on GDP growth of 50 most populous countries.

## Commodity demand will outpace supply

To illustrate, we will focus on a few representative commodities:

### Energy:

OPEC has historically attempted to raise and stabilize the price of oil by setting production quotas. Oil producers that are not OPEC members are not so constrained.

Despite quotas, today OPEC members are simply pumping oil at or near capacity. It is probably safe to assume that non-OPEC production is also at or near capacity because they are not part of the OPEC quota system.

If this is the case, then global consumption is rapidly approaching an important level: production capacity. The world is consuming approximately 85 million barrels per day. The Energy Information Administration has low-range and high-range capacity estimates for OPEC that imply surplus capacity at about 1.4 million barrels. If we assume that non-OPEC producers are similarly close to their

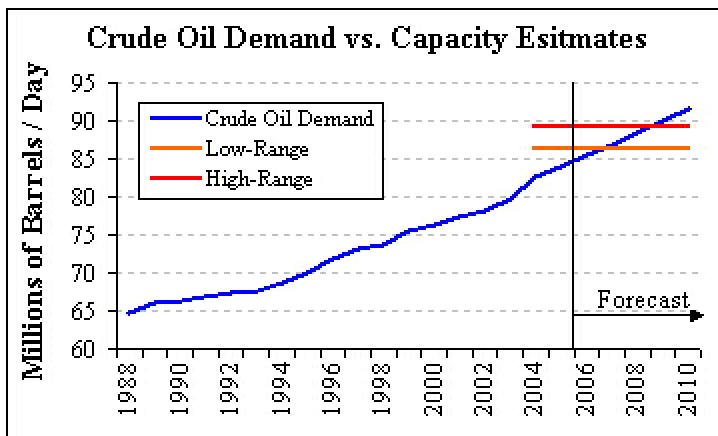
**Crude Oil Production and Capacity\***

Country	OPEC Quota	Production	Capacity Estimate	Surplus Capacity
Algeria	878	1330	1330	0
Indonesia	1425	950	950	0
Iran	4037	3900	3900	0
Kuwait	2207	2500	2500	0
Libya	1473	1620	1620	0
Nigeria	2265	2400	2400	0
Qatar	713	800	800	0
Saudi Arabia	8937	9600	11000	1400
United Arab Emirates	2400	2500	2500	0
Venezuela	3165	2500	2500	0
Iraq		1900	1900	0
Total	27500	30000	31400	1400

\* Thousand Barrels Per Day

Source: Energy Information Administration / Short-Term Energy Outlook, June '05

capacity, then we can estimate the total crude oil production capacity at between 86.4 and 89.3 million barrels per day.



This illustration demonstrates the tightness of supply even against conservative demand growth assumptions: world growth slows to 3.5% and oil demand grows at only half that rate. Demand would exceed the low-range estimate of capacity in mid-2006, and would exceed the high-range estimate in mid-2008.

New production capacity can be created in

Iraq and other countries through new investment, technology, and political stability. However, this new capacity is uncertain and expensive. There is a similar possibility that existing capacity could be diminished by terrorism or natural depletion.

### Cattle:

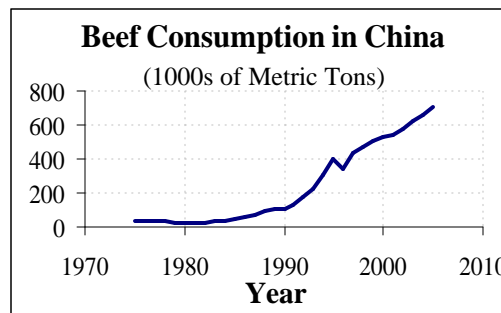
Since 1986, the price of cattle has fluctuated with demand. Since then, global beef consumption has risen by an average rate of 0.73% per year<sup>4</sup>. The corresponding return on live cattle futures contracts has been about 2% per year<sup>5</sup>.

<sup>4</sup> United States Department of Agriculture

However, populations tend to increase beef consumption as they become more prosperous. This dynamic can be observed in China, where consumption has been rising at an average rate of 11% per year since 1975<sup>4</sup>.

Chinese beef demand would have to rise another 56% to match per-capita norms in the rest of the world. However, this growth is probably an underestimate because the per-capita beef consumption in the rest of the world is substantially lowered by India (where people consume less than 15% of the average<sup>6</sup> because of religious and cultural traditions). If you exclude India, then Chinese beef demand would have to rise over 90% to match per-capita norms.

With just over 20% of the world population, global beef consumption would rise by more than 12%—historically substantial growth<sup>7</sup>. Based on the elasticity above, live cattle futures prices would increase by 32.9%. This assumption holds beef consumption in the rest of the world constant, and does not include any premium for shortages.



Raising beef requires inputs of land, water, labor, hay, grain, corn, soybean meal and salt, and growing demand for those resources will be boosted by growing demand for beef. In addition, each pound of beef that comes to market requires the energy equivalent of one gallon of gasoline.

### **Industrial metals:**

Some 200 million rural Chinese are expected to move to towns and cities by 2010, according to the United Nations; 300 million according to the Asian Development Bank. If urbanization and industrialization in China follow the same path as that of other developing countries, demand for industrial minerals will continue to rise as cities expand their infrastructure.

Infrastructure and housing account for most of the aluminum consumption in China, unlike in Western markets where the metal is mostly used for cans and packaging. Consequently, although China only accounts for about 4 percent of the world's gross domestic product, it will soon surpass the United States in consumption of aluminum. It has already overtaken the United States in its consumption of steel and copper. Morgan Stanley estimates that China accounted for 20 percent of global aluminum use in 2004, up to 35 percent of demand for steel, iron, and coal, and almost 45 percent of orders for cement.

Chinese steel output jumped more than 23 percent to 272.5 million metric tons in 2004, far outstripping the next two biggest steel producers (Japan, at 112.7 million metric tons, and the United States, at 98.5 million metric tons)<sup>8</sup>. To fuel its blast furnaces, imports of iron ore grew from 70 million metric tons in 2000 to about 200 million metric tons in 2004. China has now overtaken Japan as the world's biggest buyer of iron ore.

<sup>5</sup> Bloomberg, ticker: LC1 cmdty

<sup>6</sup> Average per-capita beef consumption for the world, excluding China and India.

<sup>7</sup> Calculations based on data provided by the USDA, Bloomberg, and the CIA World Factbook 2004.

<sup>8</sup> International Iron and Steel Institute

After decades of decline in real commodity prices, producers now have the upper hand, with the ability to dictate prices. On February 21, Vale do Rio Doce stunned steel makers when it announced a 71.5 percent price increase, effective April 1. The price of the coking coal used in steel making has followed a similar trajectory. Prices rose 120 percent in December to about \$125 per metric ton, causing consternation in Europe and other parts of the world, where plants were also facing tight supplies.

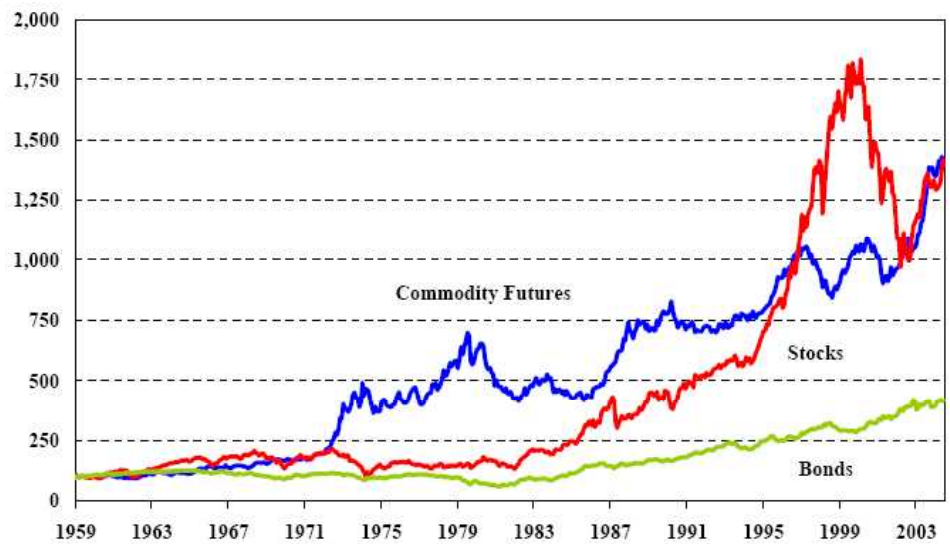
The story is similar for other metals. Nickel has reached a 15-year peak, copper and tin prices are at the highest level for almost a decade and aluminum is selling at its peak level for more than six years. London Metal Exchange copper inventories are at 36-year lows (just 36,150 tons), down 40% from this year's peak.

## Commodity investments can hedge inflation risk with low correlation to stocks

Collateralized commodity futures have offered long-term returns and risks very similar to those of equities<sup>9</sup>. In addition, commodity futures returns are negatively correlated with equity returns and bond returns. The negative correlation is due, in significant part, to different behavior over the business cycle.

While stocks and bonds tend to fall as inflation rises, commodity futures have a positive correlation with inflation (as well as with unexpected inflation, and changes in expected inflation).

Stocks, Bonds, and Commodity Futures  
Inflation Adjusted Performance 1959/7-2004/12



Source: see footnote 9.

With low correlations to other asset classes and positive correlation with inflation, commodity investments should represent a portion of most investors' portfolios. Furthermore, population, productivity, economic growth, and production capacity constraints point to long-term commodity gains.

<sup>9</sup> "Facts and Fantasies about Commodity Futures", 2005; Gary Gorton, National Bureau of Economic Research, and K. Geert Rouwenhorst, Yale University School of Management