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Gravity's revenge

The Great Convergence has helped bring the Age of Weightlessness to an end and placed resources back at the centre of economic debate.

Back in October 1996, Alan Greenspan, then the Chairman of the US Fed, gave a speech looking at the changing nature of economic output.[1] His starting point was the striking difference in the structure of US output as of 1948 compared to that of 1996. In 1948, output was 'things, big physical things'. But in the following decades, 'concepts and ideas would substitute for physical resources and human brawn in the production of goods and services' and the physical heft of the country's output would decline, as transistors replaced vacuum tubes, fibre-optics replaced copper wire and so on. As a result, 'while the weight of current economic output is probably only modestly higher than it was a half century ago, value added, adjusted for price change, has risen over threefold.'

Greenspan's 1996 speech highlighted the way in which many of the physical goods produced by the US economy – and developed economies more generally – had grown lighter over time, as the same amount of economic value was embedded in progressively less physical weight. At the same time, and even more importantly, the 'weight' of national economies was also being driven by the fact that a growing proportion of developed economies comprised the relatively 'lighter' services sector.[2]

Put these two trends together, and economists such as the LSE's Danny Quah argued that developed economies were becoming increasingly *weightless*, in the sense that a rising share of economic value was to be found in economic products with little or no physical manifestation, a process he described as dematerialisation.[3] These interlinked ideas of weightlessness and dematerialisation became very popular during the late 1990s as they did a good job of capturing the feel of an era marked by the revolution in information and communications technology in general, the rise of the internet in particular, and the hyper-optimism embodied in the dot-com share market boom. This was the age of the so-called 'New Economy', and much of that new economy was weightless.

While the New Economy boomed, the old economy languished. Thus the 1980s and 1990s were generally not a good time to be in the resources business. After a surge in commodity prices during the 1970s, real prices had slumped during the following two decades and investment in the resources sector had stagnated. The collapse of the Soviet Union, followed by the Asian financial crisis, further compressed the global demand for resources, to the extent that by late 1998 the oil price had dropped to an historic low of less than US$10 per barrel. And the logic of weightlessness seemed to imply that things were unlikely to get much better. If the process of economic development was tied closely to the process of dematerialisation, each dollar addition to a country's GDP would tend to involve a physical weight which would be falling over time, as development would see an economy shift towards goods with an ever

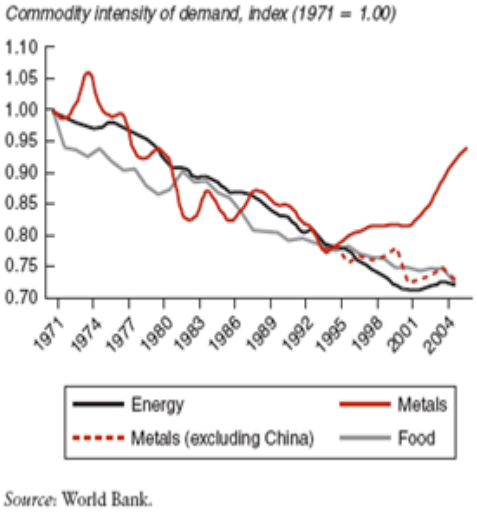
higher value per kilogram. So as countries grew richer, the relative contribution of raw material inputs would tend to decline, with this trend towards lower materials use boosted even further by technologically-driven efficiency gains.[4] As development continued and economic structures tilted away from primary production and manufacturing towards services, the commodity intensity of GDP would fall further. Indeed, the data did a pretty good job of confirming this kind of story, with the commodity intensity of GDP apparently in structural decline from the 1970s (chart):[5]

Table 2.4 Modern goods make less intensive use of commodities
(US$)

Good	Value per kilogram
Iron ore	0.04
Steam coal	0.07
Wheat	0.27
Crude oil	0.47
Standard steel	0.56
Newsprint	0.89
Supertanker	4.00
Motor car	33.00
Dishwasher	56.00
TV set	133.00
Submarine	222.00
Large passenger aircraft	1,334.00
Laptop computer	2,224.00
Mobile telephone	4,448.00
Jet fighter	13,344.00
Windows 2000 Software, CD Rom	44,480.00
Telecom satellite	88,960.00
Banking services	∞

Source: Radetzki 2008a.

Figure 2.12 The quantity of most commodities used per unit of GDP was declining until recently



Source: World Bank.

Source: Chapter 2 in World Bank, *Global economic prospects 2009: Commodities at the crossroads*. (2008)

But after the NASDAQ stock index peaked in March 2000, the subsequent bursting of the dot-com bubble took a great deal of the gloss off the new economy hype. What's more, it was increasingly clear that something interesting was now going on in the old economy, as resource prices started to recover. Gravity, and the old economy, it turned out, were about to have their revenge as the world headed into its biggest commodity boom in at least a century.

What changed? One important part of the story was the earlier period of price weakness.[6] The 1970s commodity boom had prompted a bout of over-investment that had depressed returns in the commodity sector, which in turn discouraged new investment throughout the 1980s. Then during the 1990s, so-called new economy sectors received a disproportionate share of new capital expenditure, a trend exacerbated by the dot-com bubble. This meant that when demand for resources did finally start to pick up, the resultant capacity squeeze was arrived at more quickly

than in a 'typical' commodity cycle. Which is where the Great Convergence came in: the rapid industrialisation and urbanisation of some of the world's most populous economies, led by China, was the major demand shock that was to bump up against these supply constraints. The result was what Citigroup's Alan Heap famously described as a commodities super cycle.[7] Heap defined a super cycle as a prolonged – that is, decade or more – trend rise in real commodity prices driven by the urbanisation and industrialisation of a major economy. The world had seen two previous super cycles in the previous 150 years: one from the late 1800s driven by the US economy, and one from 1945-75 as the result of post-war reconstruction in Europe and Japan's economic take-off. According to Heap, China's resource-intensive growth had now triggered a third.

The 2003-2008 commodity boom turned out to be the largest, broadest and longest of its kind in at least a century: the real prices of energy and metals more than doubled; the real price of internationally traded food increased by 75 per cent; and average commodity prices roughly doubled in US dollar terms.[8] The consequences were dramatic. In 2008, roughly a decade after hitting their record lows, oil prices were approaching US$150/barrel and commentators were worrying about a major oil shock. Perhaps even more worryingly, in the year to July 2008, the Food and Agriculture Organization of the United Nations (FAO)'s food price index rose by more than 50%, with the price of rice more than tripling in the 12 months to April 2008. By June 2008, more than 30 countries had experienced some form of social unrest or political protest linked to high food prices, sufficient in at least one case to topple a government. The double whammy of high food and energy prices prompted the IMF's Managing Director to warn that some developing countries were approaching the point at which they would have to choose between economic stability and feeding their people.

Source: http://www.fao.org/worldfoodsituation/wfs-home/foodpricesindex/en/

In the world economy of 2007 and 2008, then, 'weightless' production suddenly seemed an awful lot less important than things you could drop on your foot, like barrels of oil and bushels of wheat. Commodities, it turned out, still had immense economic and geo-political relevance. Gravity had returned to the world economy, with a vengeance.

For a while, it seemed that the onset of the global financial crisis might have changed the story once more. The deepening financial crisis certainly made a renewed case for the critical importance of the weightless part of national economies (albeit not in a good way), while the sharp contraction in global economic growth did trigger a rapid decline in commodity prices. Rather than the onset of a super cycle, perhaps 2003-2008 had just been another (albeit bigger) example of commodity boom and bust?[9] Or perhaps not: the resumption of strong economic growth in the developing world (the continuation of the Great Convergence), plus a series of adverse supply shocks ranging from the adverse climate conditions across 2010 which helped drive up food prices though to the current political turbulence in the Middle East and North Africa, which have added a new risk premium to the price of oil, have together produced a rapid recovery in resource prices. As a result, and despite lacklustre growth across much of the developed world, the oil price is once again above US$100/ barrel while the FAO's index of food prices is now above the peak it reached in mid-2008. Gravity, it seems, continues to bite.

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[1] Alan Greenspan, *Technological advances and productivity. Remarks by Chariman Alan Greenspan at the 80th anniversary awards dinner of The Conference Board.* New York, The Federal Reserve Board, 16 October, 1996
[2] Diane Coyle, *The weightless world.* Oxford, Capstone, 1997
[3] Danny Quah, Increasingly wieghtless economies. *Bank of England Quarterly Bulletin* 37 (1) 1997
[4] Marian Radetzki, *Primary commodities: Historical perspectives and prospects*. Paper presented at IMF Institute high-level seminar on *Natural resources, finance and development: Confronting old and new challenges*. Algiers, IMF Institute and Central Bank of Algeria, 4-5 November, 2010
[5] Although note that metals intensity of GDP production started to turn around from the mid-1990s, driven by China. World Bank, *Global economic prospects 2009: Commodities at the crossroads.* Washington DC, World Bank, 2008
[6] This argument is advanced in Steve Strongin, Bill Dudley and David Walton, *Underinvestment in commodities means markets will be tighter, sooner*. CEO Confidential Issue 2002/5, Goldman Sachs, April, 2002
[7] Alan Heap, *China - The engine of a commodities super cycle.* Equity Research: Global. New York, Citigroup Smith Barney, 31 March, 2005
[8] World Bank, *Global economic prospects 2009: Commodities at the crossroads*
[9] For example, the debate described in Javier Blas, So long, super-cycle. *Financial Times*, 9 December 2008.