



Focus on

Cement consumption in a long term perspective

July, 7th 2009

1. Introduction

While we are in the midst of the worst economic downturn since World War II it is impossible to forecast how it will ultimately develop and resolve.

However, the feeling is widespread that the ongoing crisis will mark a watershed between two different stages of the world economic development, something that in the future could be compared to the first oil shock (that put an end to an era of stability and high economic growth in the industrial area).

Clearly, a downturn as serious as the ongoing global one affects all economic sectors, though to a different extent. In this regard, to adopt a long term view may be more useful than any effort to predict or anticipate turning points in the near future. In this *Focus on* we have thus addressed the issue of how cement (and other basic materials) behaved in the very long run at world level and in the main economic areas. Obviously, past dynamics are by no means a guide to forecast the future. However, they may shed some light on fundamental trends and problems that are likely to persist even once the current crisis is over.

2. Cement compared to other basic materials

It is widely believed that the large flow of new technologies that have entered production chains over the last 15 years (internet, ICT, knowledge economy at large) has, as a by-product, also reduced the utilisation of primary goods or those intermediate products needed to manufacture every sort of finished, be it consumption or investment good.

Long term trends do not confirm such belief. In graph 1 consumption of some basic products is reported in comparison to world GDP. In this context, three major aspects stand out.

For a start, three periods may be singled out: one, until the first oil shock (1973) that is mainly related to the post-war reconstruction phase and the long period of economic/monetary stability that ensued; a second one of reduced growth/high instability (1973-1992) that was marked by the oil shocks and the Soviet Union collapse. Finally, in the last 15-16 years GDP growth has resumed a more solid path, averaging 4% pa mainly thanks to the increasing contribution of the emerging area.

Secondly, as said, consumption of some basic raw materials has increased more rapidly than GDP across the period of almost sixty years under review (being copper and steel relevant exceptions¹). This holds true even in the last few years.

Thirdly, cement ranks high in this list, largely outstripping GDP growth, with – on the other hand – oil consumption growing across almost 60 years below GDP (see Box 1).

Cement is traditionally considered a mature product, so one should expect that consumption underperforms GDP, and the more so in the last period (1992-today). Actually, the opposite occurred and – as said – cement was among the best performers across the whole period and consumption accelerated to roughly 6% pa in the last sub-period. Three factors can help explain such an unforeseen trend:

- all basic materials have faced stiffer competition from other goods; in other words there may have been a substitution effect hitting growth of demand for some specific materials;
- secondly, such materials are used as intermediate goods in processes where technological innovation has played and still plays a larger role in terms of reduced consumption for final output unit;
- as for cement, growth in demand has been shifting towards the emerging area where basic construction needs have still to be filled (this point is developed in the following paragraph); in addition, both substitution and technological innovation seems to have played a more limited role in the construction industry.

Box 1 - Oil: a different consumption path

An additional remark in this comparison may be related to oil. After the two oil shocks of the Seventies, oil demand recovered only in 1993 the level it attained in 1979. Also afterwards growth in demand for oil has been very moderate (1.4% pa even at a time of robust global output growth). As a matter of fact, oil intensity per unit of world output more than halved in the last 30 years, with a substantial part of efficiency gains obtained in the early Eighties and in the last few years, when the oil price constraint became once again crucial.

3. Cement consumption trends by major areas

As already said, cement demand has by far outpaced global output growth over the whole post war period. Together with higher growth, cement has also shown higher volatility over time. However, only one contraction in absolute terms has been observed (during the Nineties) and it was related to exceptional events. In particular, 1992 data are influenced by the collapse of the USSR and the other socialist regimes.

¹ In the above two cases it may be thought that there has been both substitution with other materials and also less usage per unit of output (a typical car today contains, for instance, by far less steel than an equivalent car built twenty-thirty years ago).

It is also worth noting that in the last ten years both cement consumption and GDP growth have accelerated (5.6% pa the average for cement).

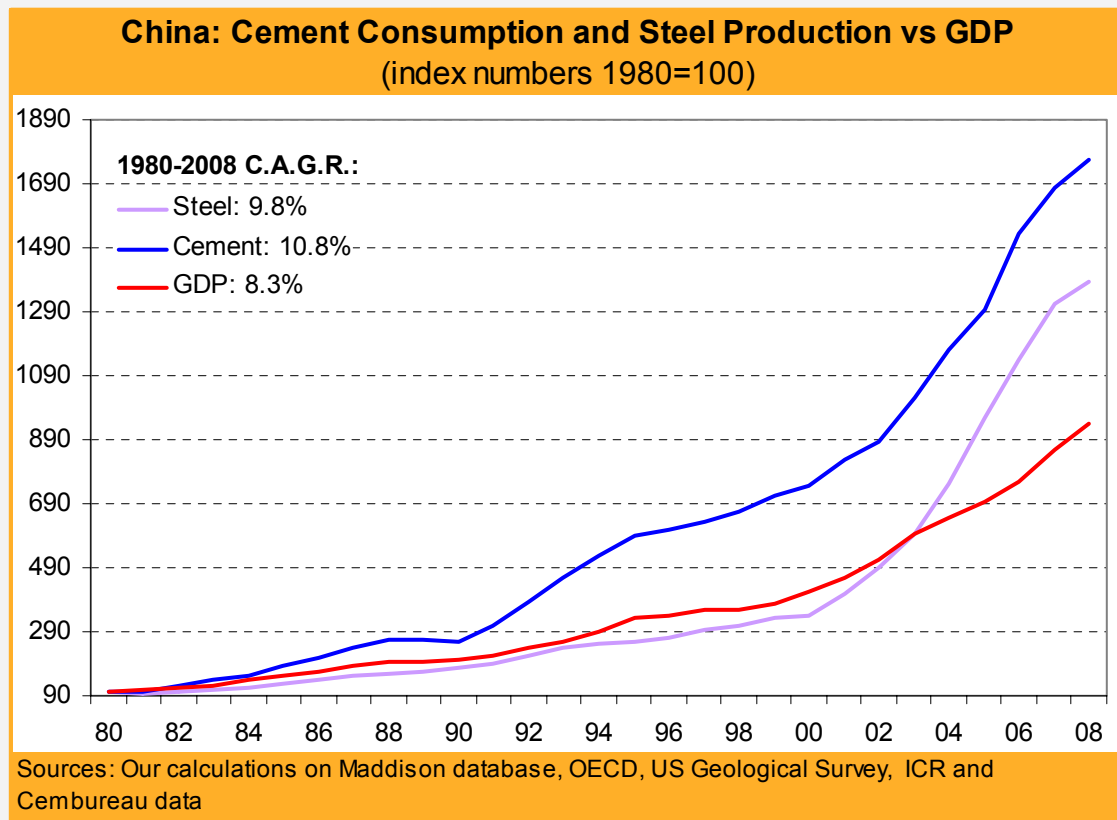
A fairly different story may be told taking global figures net of China's contribution (graph 2 and Box 2). Two elements are striking: first, in the post-war reconstruction phase (1950-1973) cement grew at an unparalleled pace (7.4% pa, or roughly 1.5 times GDP growth); second, since the first oil shock, overall cement consumption growth was much lower (less than 1/3rd of previous period average) and fell below GDP growth itself.

Box 2 – The overwhelming role of China

The above developments have by and large been determined by the dominant role that China has gained in the world scene in less than thirty years. In 1980 China accounted for less than 10% of total world cement and about 5% of world steel. Now (in 2008) it holds roughly 50% of cement and 38% of steel world production as growth rates since the start of the *Big Leap Forward* policy (end of the Seventies) were close to 11% and 10% respectively (see also graph below). Given that the ongoing downturn is affecting China to a definite lesser extent than the rest of the world, these percentages are set to increase sensibly in the current year.

In the light of the above it is apparent why China is increasingly considered *the factory of the world*.

Clearly, it is impossible to predict whether such pace of growth will be sustainable also in the future. However, the shift from foreign to domestic demand that the Chinese government is pursuing should in principle sustain cement demand also in the medium-long term.



These latter disappointing outcomes have been largely determined by the most industrialised area (Europe 15, the US, Japan, see graph 3) where cement consumption growth has virtually disappeared since 1973. Before that year cement growth was above 6% pa, which signals that 1973 actually represented a structural break in the consumption pattern. It is also worth noting that in the above 1973-2008 period 1/3rd was made up of recession years, while in the same time span GDP growth never turned negative and was on average close to 2.5% pa. Given that, cement intensity per output unit fell in 2008 to slightly above 40% of the level where it stood in 1973 for this area as a whole.

On the other hand, when we consider the world total net of the most industrialised area, in the whole 58 years period of our sample cement growth reaches a stunning 7% pa (graph 4) and shows no sign of slowing down in the most recent time span (7.5% pa in the last decade).

Useful suggestions can be drawn when the world total is eventually taken net of both China and the most industrialised area (graph 5). This admittedly mixed aggregate (which includes some advanced economies together with the poorest African countries and the ex-Soviet Union, now CSI) makes up roughly 38% of current cement consumption (or roughly 1.1 billion tons in 2008). Here, three aspects are worth underlining:

- over the whole period cement demand growth has been robust (5.6%) and widely above overall output growth (4%);
- in the last decade consumption growth has remained in line with the long term average (and has dramatically re-accelerated compared to the previous decade);
- cement intensity has kept rising even in the last few years, which signals that, on average, this heterogeneous aggregate has not entered so far into its more mature stage.

4. Concluding remarks

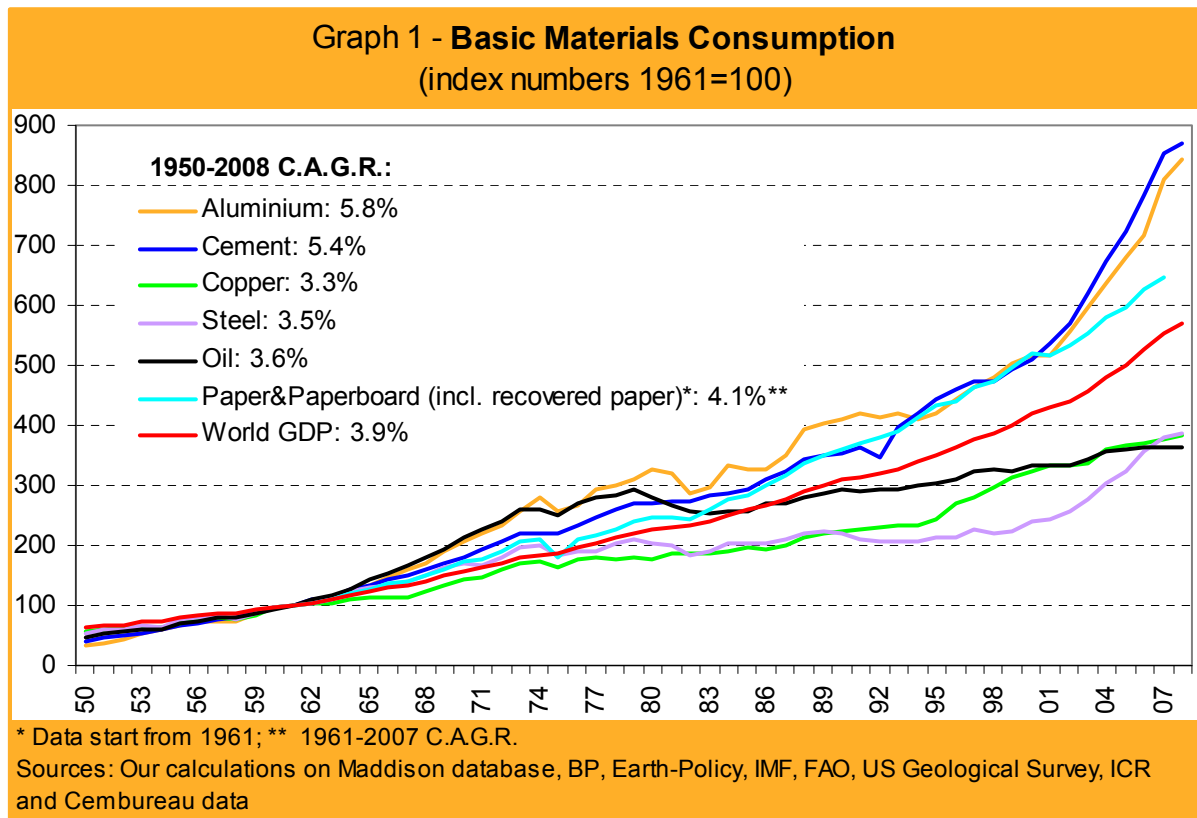
The ongoing crisis does not support an optimistic view as far as global cement consumption is concerned. For the first time since the second world war cement consumption growth could turn out negative as an effect of a deep and widespread economic downturn (while in past circumstances – 1992 – a negative outcome was related to more specific and localised factors) and there is also widespread consensus that even 2010 will represent another difficult year.

Still, a closer look at long term figures may help to draw a more cheerful view. As a matter of fact, in the past cement consumption has performed better than other basic/intermediate products particularly given that many emerging economies have entered a stage in their economic development where cement intensity is rising. In perspective, other countries will reach such stage fairly soon.

Needless to say, the exceptional performances registered up until two years ago are not likely to be restored for a long period ahead and it is also probable that in

the future cement demand growth will be more unevenly spread through regions and countries.

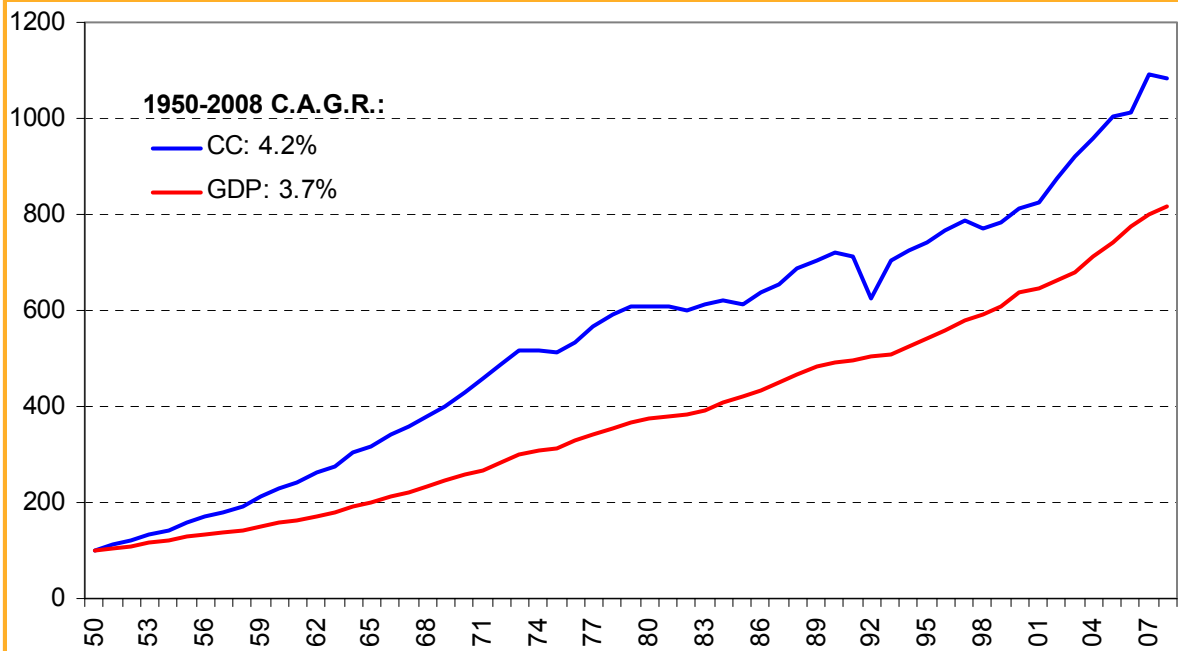
In sum, while in the industrial area cement demand has been – although with ample variations – almost flat in the last 35 years and prospects do not point to a sudden recovery, in the rest of the world potential for growth remains tremendous even when China is excluded.



* For GDP data, series up to 1979 are derived from Maddison, A. (2007), *Historical Statistics for the World Economy: 1-2003 AD* (http://www.ggdc.net/maddison/Historical_Statistics/horizontal-file_09-2008.xls), while figures from 1980 up to 2008 are taken from the International Monetary Fund *World Outlook Database*, April 2009 (<http://www.imf.org/external/pubs/ft/weo/2009/01/weodata/index.aspx>). The source for aluminium, copper, and steel data is the US Geological Survey (<http://minerals.usgs.gov/minerals/index.html>), while for paper and paperboard, which include also recovered paper, the data source is the Food and Agriculture Organization of the United Nations statistical forestry database (<http://www.fao.org/corp/statistics.html>). The source of steel data for China from 1980 to 2008 is the International Iron and Steel Institute (<http://www.worldsteel.org>). The oil production series is derived by the Earth Policy Institute for the period 1950-1964 (http://www.earth-policy.org/Updates/2007/Update67_data2.htm#table1), while data from 1965 to 2008 are from British Petroleum's *Statistical Review of World Energy 2009* (<http://www.bp.com>).

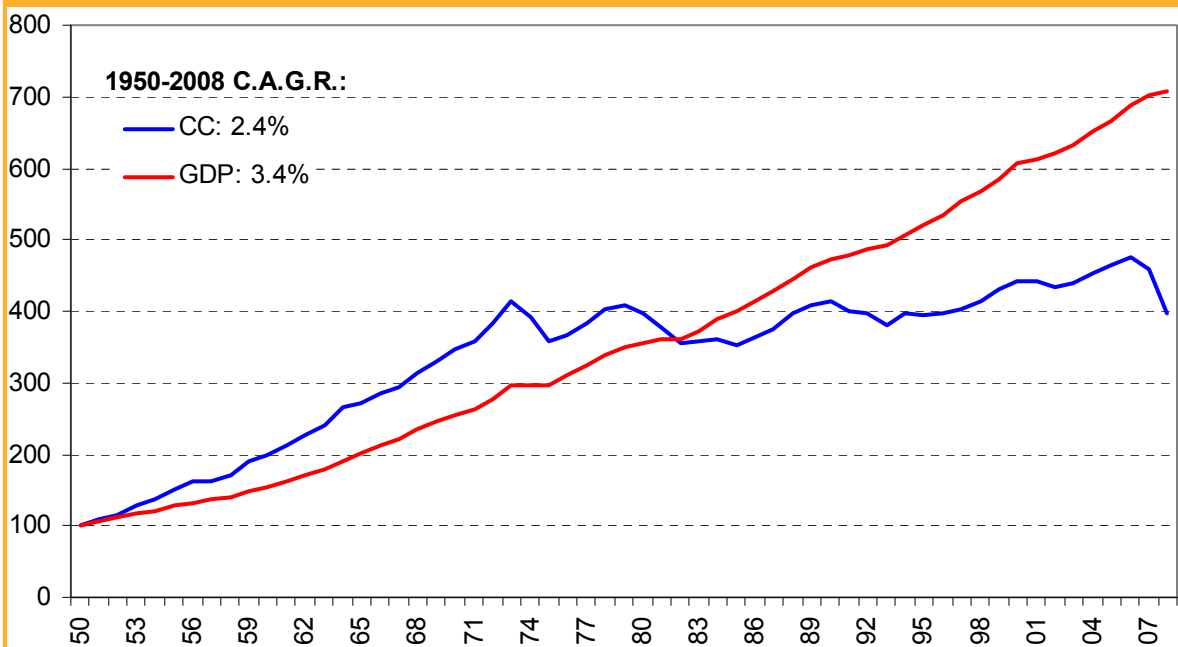
For World cement data, series up to 1991 are derived from Cembureau, while figures from 1992 up to 2008 are taken from the US Geological Survey (<http://minerals.usgs.gov/minerals/index.html>). The cement consumption series for China is derived from Cembureau for the period 1950-2007, while the figure for 2008 is taken from International Cement Review, (2009), *The Global Cement Report: Eight Edition*.

Graph 2 - World ex China: GDP and Cement Consumption
(index numbers 1950=100)



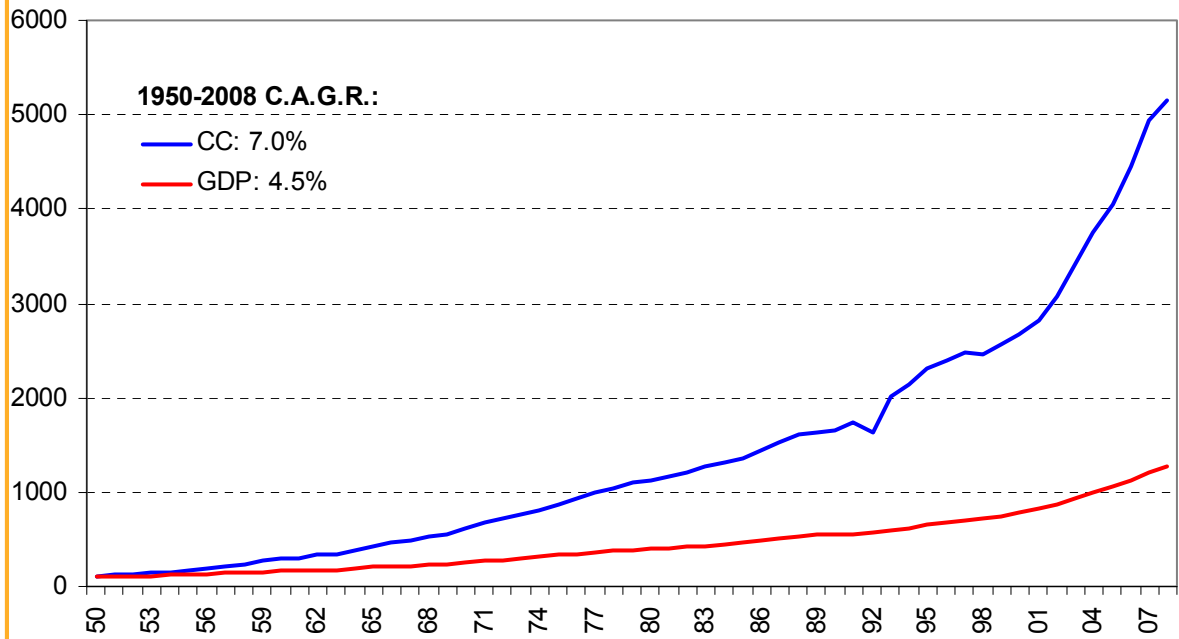
Sources: Our calculations on Maddison database, IMF, US Geological Survey, ICR and Cembureau data

Graph 3 - US+EU15+Japan: GDP and Cement Consumption
(index numbers 1950=100)



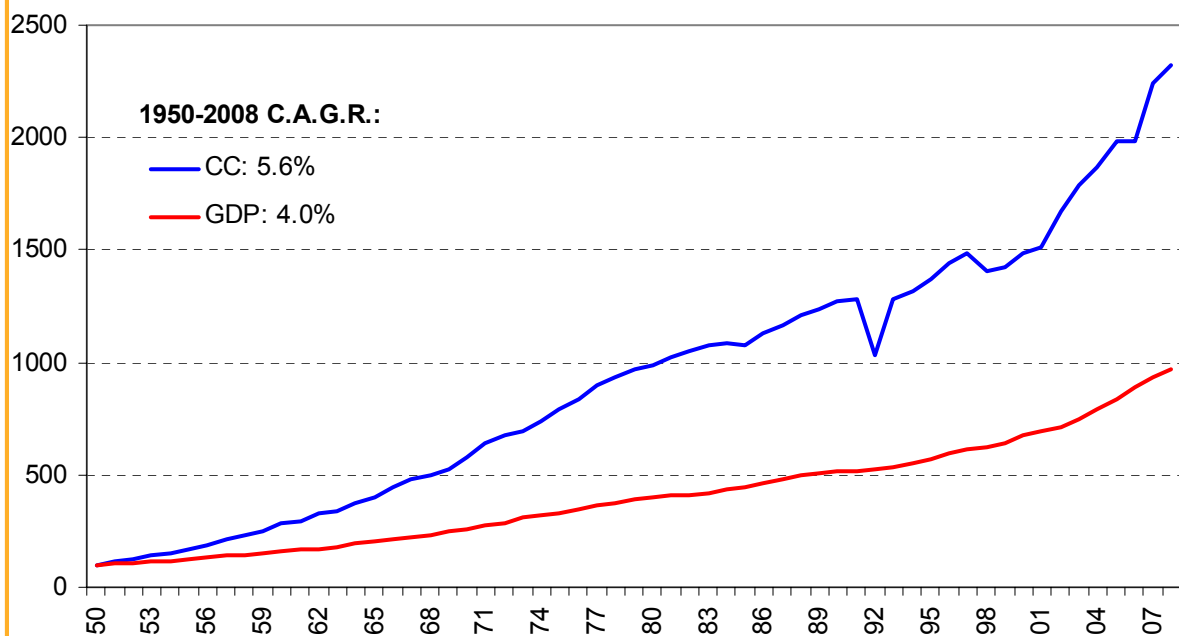
Sources: Our calculations on Maddison database, IMF, US Geological Survey, ICR and Cembureau data

Graph 4 - World ex (EU15+US+Japan): GDP and Cement Consumption
(index numbers 1950=100)



Sources: Our calculations on Maddison database, IMF, US Geological Survey, ICR and Cembureau data

Graph 5 - World ex China and (EU15+US+Japan): GDP and Cement Consumption
(index numbers 1950=100)



Sources: Our calculations on Maddison database, IMF, US Geological Survey, ICR and Cembureau data