Myth and Reality: Dr Illarionov's Projections

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Andrei Illarionov recently 'argued that GDP growth and carbon dioxide emissions are fundamentally linked, and that Moscow's targeted economic expansion will soon put Russia above the greenhouse emission limits set by Kyoto. "In those countries we analyzed, each percent of GDP growth is accompanied by an increase of carbon dioxide emissions by 2 percent," he said'[2]
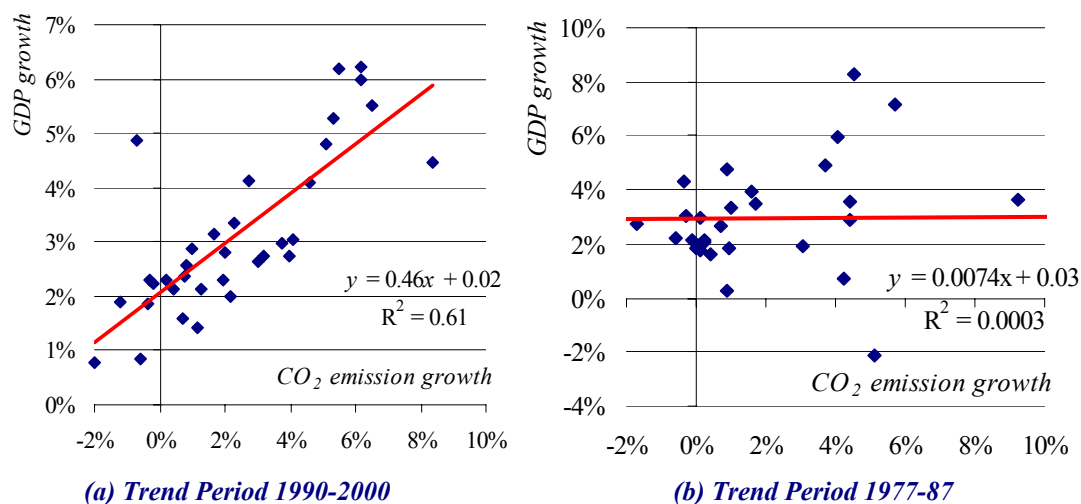

(a) Trend Period 1990-2000   (b) Trend Period 1977-87

Figure 1. Illarionov: CO_2 – GDP Growth Trend Correlation

Data Sources:
GDP: IMF *The World Economic Outlook* (WEO) Database April 2003; 1970-2000; Local currency, fixed prices
CO2: CDIAC; Total Emissions (excluding land-use).

To make his projections of Russian CO_2 emissions in 2010 and 2050 – presented at the National Press Club in Washington D.C. on 30 January 2004 – Illarionov uses a linear trend analysis based on average GDP and CO_2 emission growth rates during the ('trend') period of 1990 to 2000. In the case of what he refers to as 'developed countries'[3] – depicted in Fig. 1.a –there is indeed a moderate correlation ($R^2 = 0.61$) between these average growth rates for his trend period (1990 to 2000), and the inverse of the trend-line slope (1 : 0.46 = 2.2) does lend itself to be interpreted as a 'trend elasticity', in the sense that each percentage point growth of GDP is associated (in trend) with 2.2% growth in CO_2 emissions.[4] Given President Putin's stated aim of doubling GDP requires an average annual GDP growth of 7.2%, it is not difficult to see how under this Illarionov hypothesis, Russia might easily surpass its Kyoto emission target (= return to 1990 levels) even though it is at present well-below it.

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[2] 'Illarionov Makes His Case On Kyoto', *Moscow Times*, 18 December 2003:p.1.

[3] Argentina, Australia, Austria, Bahamas , Belgium, Canada, Chile, Cyprus, [Czech Rep], Denmark, Finland, France, Greece, Hong Kong, Hungary, Iceland, Israel, Italy, Japan, Korea , Malta, Mauritius, Netherlands, New Zealand, Oman, Portugal, [Slovak Rep], [Slovenia], Spain, Sweden, Switzerland, Taiwan, Trinidad and Tobago, United Arab Emirates, United Kingdom, United States, Uruguay (sic!), Venezuela (sic!)

[4] Illarionov fails to disclose his data sources which is why the calculation here are based on the sources indicated in Figure 1. His own calculations imply a CO_2 trend-elasticity of 1.9%, 2.3%, and 2.1% for "developed", "mid-income", and "low-income" countries respectively.

The method used by Illarionov, if sound, produces some remarkable results: consider, for example, the fact that – according to the Illarionov trend line (Fig. 1.a) – a "no-growth" scenario implies an annual 5.2% *reduction* in emissions, which means that all Illarionov's "developed countries" would need to do to achieve a staggering 91% reduction of emissions by 2050 is to be content with their current wealth. Indeed, even a modest 'business-as-usual' annual economic growth of 1.1% would, according to this methodology, ensure the UK to achieve the recommendation on 'reducing carbon dioxide emissions by some 60% from current levels by about 2050'[5], while 2% growth *per annum* would still be sufficient to stabilize emissions at present levels under business as usual conditions. All this does rather seem too good to be true.

Unfortunately, Illarionov's method turns out to be fundamentally unsound. For one, he bases his projections on the unjustified assumption that certain current correlations ('trends') will continue to exist during his chosen 10 to 50 year projection horizons. And even if he were justified in this assumption, his second assumption that these correlations are constant over time is equally ill-founded.
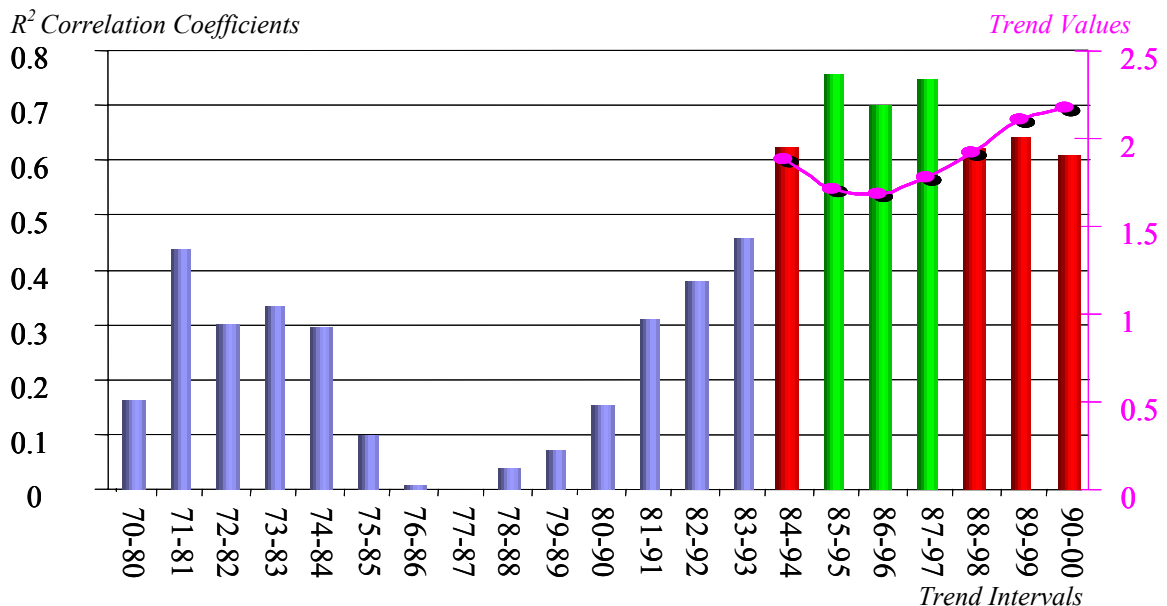

Figure 2: The Dynamics of Illarionov's Trend Figures
Data Sources: as Fig. 1.

Too see this, consider the situation graphically represented in Figure. 2: If the ten-year interval used by Illarionov to establish the average growth figures is shifted backwards in time, then the correlation between these figures (the linear trend) at first becomes stronger (green bars with a R^2 correlation coefficient ≥ 0.7), but then quickly deteriorates only to disappear completely when based on the 1977 – 87 trend interval, a fact which becomes obvious to the naked eye when we represent these 77-87 average growth rates graphically (see Fig. 1.b). Moreover, even in those cases where there *is* a reasonable correlation (red and green bars in Fig. 2) the trend *value* – the slope of the trend line – is *not* constant over time, but fluctuates between 1.6 and 2.2.

Dr Illarionov's projections are therefore ill-founded. They are, in particular, not a matter of a different but justifiable opinion that may or may not be wrong. They are simply not meaningful projections.

[5] The Royal Commission on Environmental Pollution, Twenty-Second Report, 'Energy — The Changing Climate', 2003, http://www.rcep.org.uk/newenergy.htm