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**Green Growth, Green Paradox and  
the Global Economic Crisis**

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# Green Growth, Green Paradox and the Global Economic Crisis<sup>1</sup>

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## Abstract

*A Schumpeterian case can be made for boosting Green Growth in a global economic crisis. The best way to achieve this is a combination of R&D subsidies to redirect growth from polluting to clean economic activities and a credible, rising carbon tax to speed up the transition to the carbon-free era. If a carbon tax is infeasible, renewables subsidies might be a second-best alternative to reduce the duration of the fossil fuel era and curb cumulative carbon emissions despite some adverse, short-run Green Paradox effects.*

**Keywords:** Green Growth, crisis, R&D, carbon tax

Green Growth ranks high on the agenda of international organizations and many individual countries and is seen by some as a panacea for coming out the global financial and economic crisis (e.g., OECD, 2011). Of course, it is not clear whether national income is a good proxy for happiness in rich countries<sup>4</sup>. However, in developing countries boosting national income can lift many people out of poverty. Green growth is an important way to improve happiness as it reduces the adverse effects of unemployment, pollution and global warming. This is especially true given that much of the world is still suffering from the aftermath of the global economic crisis. The challenge is thus to achieve growth in conventional national income without large and irreversible negative impacts on the environment. By redirecting the economy from dirty sectors to clean sectors one can achieve Green Growth without shrinking the size of the economy. Green Growth is thus seen as an alternative strategy for shrinking growth aiming at reducing emissions of pollutants and the deterioration and depletion of natural resources. Structural

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<sup>4</sup> Stiglitz et al. (2009, p. 9) put forward “...had there been more awareness of the limitations of standard metrics, like GDP, there would have been less euphoria over economic performance in the years prior to the crisis”. In the past many other economists have cast doubt on the value of national income as a welfare indicator.

change and technological efficiency improvements are necessary but not sufficient when there is a lack of political support.

The hope is that a Green New Deal which invests billions in projects that protect the environment will generate a *triple whammy*: growth in conventional income will get a boost and will lead to lots of extra jobs; the protection of the natural environment will by itself not necessarily go at the cost of growth but may even enhance it and Green Growth provides a higher sustainability level for the global economy than business as usual. This works through several channels such as improved labour productivity as a consequence of better health, increased energy efficiency by removing market failures and unnecessary subsidies and providing better information on home insulation, and by large investments in green infrastructure (e.g., parks, cycle lanes or railroads), and by stimulating innovation (e.g., Barbier, 2011; Hallegatte et al., 2011; World Bank, 2011; Acemoglu et al., 2012; Smulders et al., 2012).

The chances of getting policies off the ground to kick-start Green Growth in times of global economic crisis seem slim for three good reasons. First, policy makers have different priorities such as balancing the public budget, rescuing banks and bankrupt countries, and solving unemployment. In times of economic hardship people are naturally more concerned with the immediate concerns of solving unemployment and poverty among the hardest hit citizens than climate policy which might have some social return many decades or centuries ahead. Second, emissions of carbon and other pollutants are less in an economic recession which may reduce the appetite of policy makers to embark on an ambitious environmental policy. Third, imposing a substantial and rising carbon tax is viewed to frustrate economic recovery. The Stern Review estimates the cost of such a carbon tax at about 1 percent of global GDP, but many argue that this is an under-estimate especially when the global economic recovery turns out to be fragile.

Schumpeter, on the other hand, has pointed out the cleansing effects of recessions on enterprises and the same may be true for governments as well. Recessions are seen as an opportunity to get rid of inefficiencies and to embark on more promising avenues. In the same vein Smulders (2010) argues that a (temporary) recession offers opportunities for increased stringency of environmental policy: because of reduced aggregate demand at the macro level the cost of environmental policy in terms of reduced profits are relatively small and, because of lower interest rates, the present value of future marginal damages are higher.

It is important to stress that both financial and environmental sustainability must be aimed for. So it does not make sense to have interest relief for mortgages when this encourages reckless borrowing without redeeming any of the debt or to deregulate investment banking and have slack financial supervision. Similarly, it makes no sense for governments to subsidize coal-fired electricity generation or other

economic activities such as steel production or greenhouses used in horticulture which are harmful to the environment.

The government can instead try to use the current recession to redirect the economy towards sustainable Green Growth paths and the best way to do this is probably R&D subsidies rather than carbon taxes (Acemoglu et al., 2012). At the same time governments should not pretend to know better than business by betting on particular sources of renewable energy. The outrageously high subsidies for solar energy in German electricity production have been criticized by many. Although such subsidies for stimulating diffusion of renewable alternatives to fossil fuel are often well intended and seen as a second-best alternative for the first-best, a gradually rising carbon tax which is politically much less attractive, they typically have undesirable effects in that the anticipated expropriation of fossil fuel reserves induced by fossil fuel being made obsolete by cheaper renewables leads to higher short-run fossil fuel extraction rates. This has been coined the Green Paradox (Sinn, 2008). In practice, extraction costs increase as deeper, less accessible fields have to be extracted and the market will find it unprofitable to fully exhaust reserves. A renewables subsidy would then bring forward the carbon-free era. At the moment of the transition to renewables the extraction cost of fossil fuels must equal the price of renewables. With a lower renewables price, the stock of fossil fuels left unexploited is larger and thus cumulative carbon emissions will be lower. Although in the short run emissions would be higher and global warming would be accelerated, cumulative emissions in the long run would be reduced. The latter effect often dominates, so that a renewable subsidy does offer long-run prospects for a reduction in global warming (van der Ploeg and Withagen, 2012a). Other policies such as a very rapid increase in carbon taxes can also give rise to short-run Green Paradox effects, but will ultimately leave more fossil fuel in situ and thus generate less cumulative emissions. If the stage of development is taken into account, it can be shown that climate policy will be less ambitious in developing economies where the marginal benefit of consumption is higher than that of reducing fossil fuel use (van der Ploeg and Withagen, 2012b). If an economy has to rely on second-best policies such as subsidization of renewables, the adverse climate effects of these policies are thus less harmful in times of crisis. The reason is that in times of crisis the marginal utility of consumption is high relative to that of increased emissions, whereas also the increase in emissions will be relatively small in view of reduced economic activity.

Climate policy should try to change the direction of technical progress towards Green Growth, especially in times of economic crisis (Acemoglu, et al., 2012). R&D subsidies will suffer from adverse Green Paradox effects in the short run. Still, compared to the absence of subsidies they will induce more fossil fuel to be left unexploited and will ultimately curb global warming. Climate policy which is only undertaken by a sub-group of countries suffers from spatial Green Paradox effects (also known as import

leakage or carbon leakage): other countries benefit from the lower prices of fossil fuel and increase their demand.. In addition the pollution-haven effect may pop up: relocation of activities taking place to jurisdictions with more lenient environmental policy. Global climate policy should therefore be best directed at a more conservative use of fossil fuel reserves, that is, leaving more of them unexploited. One way to achieve this is for rich countries to buy up fossil fuel deposits and manage them according to their climate objectives (Harstad, 2012). The sad fact is that such a buy-up strategy may be realistic for tropical rain forests, but not for the large global reserves of oil, gas and coal.

Crucial instruments to get the process towards Green Growth started are *getting the prices right* and *stimulating innovations*. Both are closely related. The former includes taxation of externalities (carbon taxes), abolishing carbon tax exemptions and subsidies for dirty industries (such as coal, greenhouse horticulture or steel production), creating markets, and installing tradable emission rights. The latter can be achieved by getting the prices right as well and by enhancing research and development. Of course, simple textbook recommendations are difficult to implement in reality because of political economy considerations, pre-existing market imperfections elsewhere in the economy, inertia, or lack of necessary investment funds. Hence, in many instances policy makers have to rely on second-best instruments. A salient example is energy policy, where it turns out extremely difficult to get rid of subsidies on fossil fuels and where the introduction of an adequate carbon tax faces many obstacles (e.g., Nordhaus, 2010).

The plea for getting rid of externalities and for creating the right incentives is appealing. Proponents of Green Growth should be aware though of the Green Paradox and other pitfalls of the actual working of economies. Green Growth provides a more attractive and sustainable alternative to coming out of the global crisis than going back to brown growth. It requires a rising path of carbon taxes to correct for the global climate externalities, abolishing coal and other fossil fuel subsidies, and R&D subsidies to redirect growth and internalize learning-by-doing and other positive externalities in the absence of effective patent protection. If for political reasons a carbon tax is infeasible then renewables subsidies might not be too bad. In spite of some short-run Green Paradox effects they bring forward the carbon-free era and curb cumulative carbon emissions.

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