Chapter 28
Does Fiscal Policy Influence Per Capita CO_2 Emission?
A Cross Country Empirical Analysis

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ABSTRACT

Encouraging economic activities is a major motivation for countries to disburse subsidies, but such transfers may also lead to sustainability and climate change related concerns. Through a cross-country empirical analysis involving 131 countries over 1990-2010, the present analysis observes that higher proportional devolution of budgetary subsidies lead to higher CO_2 emissions. The results demonstrate that structure of economy is a crucial determinant for per capita CO_2 emission, as countries having higher share in agriculture and services in GDP are characterized by lower per capita CO_2 emission and vice versa. The empirical findings also underline the importance of the type of government subsidy devolution on CO_2 emissions. Countries having high tax-GDP ratio are marked by lower per capita CO_2 emission, implying that government budgetary subsidy is detrimental for environment whereas tax is conducive for sustainability. The analysis underlines the importance of limiting devolution of subsidies both in developed and developing countries.

1. INTRODUCTION

Providing subsidies to local players is a time-tested policy instrument, which can be applied for responding to various motives, e.g., countering domestic distortions (Bhagwati and Ramaswami, 1963), for granting 'infant-industry' protection (Melitz, 2005), for facilitating innovation, supporting national champions as a part of the long term industrial policy, ensuring redistribution, etc. (Howse, 2010; WTO, 2006). A country may extend subsidies to their primary, manufacturing and service sectors through various channels, e.g., through input subsidies (e.g. per unit fuel subsidy), output subsidies (e.g. per unit price support) and 'regulatory reliefs' in terms of maintaining weaker

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environmental regulatory standards and tax reliefs (Barde and Honkatukia, 2004; Heutel and Kelly, 2013; Fisher-Vanden and Ho, 2007).

Existence of subsidies *per se* does not necessarily lead to adverse environmental consequences. For instance, carefully crafted subsidy policies can contribute significantly for ensuring environmental protection in an economy (e.g. subsidies for promoting organic farming or other forms of environment-friendly agriculture, technology upgradation support to industry for securing lower emissions, promotion of renewable energy etc.). Nevertheless, the adverse environmental implications of subsidies are well documented in existing literature. On one hand, several environmental implications of input subsidies have been underlined (Heutel and Kelly, 2013). First, demand for any subsidized input is expected to witness an increase due to substitution of other non-subsidized inputs. Second, firms enjoying the benefits of the subsidized inputs tend to produce more due to the fall in per unit production expenses, which increases their demand for all inputs in general. As a result of the consequent change in input usage patterns, the sectors benefiting from input subsidies generally grows in size and their expanded scale of operation might lead to over-production and in turn over-exploitation of resources. On the other hand, if the government provides output subsidies by offering higher price per unit of output produced to the producers, the chain of events again may potentially result in over-use of inputs, over-exploitation of resources, over-production and consequent environmental degradation (van Beers and van den Bergh, 2001). The existing literature supports this contention by underlining that subsidies generally encourage overuse of dirty inputs and enable the environmentally inefficient producers to continue in the market (Barde and Honkatukia, 2004). Conversely reduction of subsidies enhance environmental sustainability by lowering pollution-causing capital accumulation, shifting of capital and labor to less pollution intensive firms and enhancing the output of more productive firms (Bajona and Kelly, 2012).[1]

In addition to the existing theoretical and empirical literature, the subsidy-environment linkage has received considerable attention in the regulatory forums as well. For instance, the adverse environmental implication of subsidies in general, and energy subsidies, which encourage greater use of fossil fuels in particular, is well recognized in the UN discussion forums. It is estimated that world emissions of CO_2 and Green House Gases (GHGs) can be reduced by 13 and 10 percent respectively by 2050 with the removal of fossil fuels and electricity subsidies in 20 non-OECD countries (Burniaux et al., 2009). One major objective of the Kyoto Protocol negotiations has been to secure reduction of subsidies, which lead to GHGs emissions (UNEP, 2003). The Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) noted that, "Direct and indirect subsidies can be important environmental policy instruments, but they have strong market implications and may increase or decrease emissions, depending on their nature" (IPCC, 2007). A similar spirit has subsequently been echoed in the Rio+20 Conference declaration as well, "We remain focused on achieving progress in addressing a set of important issues, such as, *inter alia*, trade-distorting subsidies and trade in environmental goods and services" (UNCSD, 2012). However, the UN initiatives for reduction of fuel subsidies have till date achieved limited success so far (Keen, 2012; IMF, 2013). One underlying reason is that the provisions under Kyoto Protocol, "does not specify the policies that states must use to achieve the bound emission reductions, or the relative desirability of different policy instruments" (Howse, 2010). In other words, the participating countries are expected but not strictly compelled to reduce the harmful subsidies being provided to their domestic players.

In addition to the United Nations Environment Programme (UNEP) initiatives, the multilateral