P6.1-5 Brazil Carbon Market Model: Objectives, General Structure and Pending Empirical Issues

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Brazil is going to undertake voluntary monitorable, reportable and verifiable commitments in the Climate Convention. In doing so, current and future national efforts on GHG mitigation will be recognised giving the country a leading position in the global effort to combat climate change.

Mitigation opportunities in Brazil are mainly in the possibilities of reducing emissions from deforestation and forest degradation (REDD) that are also aligned with goals of environmental preservation.

REDD options have a much lower cost than most mitigation actions in energy conversion and industry. So this cost heterogeneity can be a source of efficiency gains through an offset programme. If combined with appropriate economic instruments, such as a national carbon market, such options offer opportunities for an environmentally and economically efficient transition to low-carbon economy.

This study therefore intends to examine some regulatory aspects of a national carbon market where there would be a national cap on GHG emissions and tradable emission permits distributed among economic agents.

Objectives

We intend to analyse how mitigation affects the Brazilian economy taking into account general equilibrium effects of technical changes induced by mitigation options cleared in a carbon market.

We can expect that each level of national commitment will lead to distinct carbon equilibrium prices and economic impacts in a non-linear fashion. The same applies for distribution criteria of permits in regard to income transfer among economic agents.

So the direction and magnitude of economic and distributive impacts are crucial to guide the building up of the regulatory framework of the carbon market.

Therefore, we intend also to answer the following questions:

1. What would be equilibrium price of permits according to each level of national commitment?
2. And what would be the respective economic and distributive impacts?
3. What is the magnitude of income transfer according to each permit allocation criteria from grandfathering to auction?
4. And if trade is allowed with other carbon market abroad?

Structure

The model fits into the category of integrated model with technical change already discussed elsewhere (see, for example, Bosetti et. al., 2006, Popp, 2006 and Edenhofer, 2006). Our contribution will be to integrate technical coefficients of mitigation options following an endogenous routine into the general equilibrium model.

So we will reckon on the integration of three models, namely:

Carbon market model (CMM): model in joint development by IPEA (Instituto de Pesquisa Econômica Aplicada, Rio de Janeiro) and IPEA-BC3 (Basque Center for Climate Change, Bilbao) that is structured with built-in marginal costs of mitigation industry with optimisation mechanisms for closing prices and quantities.

General equilibrium model (GEM): model IMACLIM developed by CIRED (Center International de Recherche sur l'Environnement et le Développement, Paris), to be shared with IPEA-Rio and Centro Clima(Centro de Estudos Integrados sobre Meio Ambiente e Mudanças Climáticas, Rio de Janeiro), that provides detailed and specific identification of the sectors of transport and energy and uses a recursive element update of technical coefficients based on a