***POLITICAL ECONOMY OF CARBON PRICING POLICIES: EVIDENCE FROM A PANEL OF COUNTRIES***

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**Overview**

An economy-wide price of carbon (as well as other Greenhouse Gases) has long been advocated as a cost-effective way of inducing reductions in CO2 (or other GHG) emissions. Yet, the coverage of carbon-pricing schemes (i.e. taxes based on the carbon content of a fuel or Emissions Trading Schemes) was for a long time relatively modest compared to global GHG-emissions. This changed with the introduction of the EU-ETS in (originally) 25 countries and the development of new schemes in other jurisdictions in subsequent years.

Nonetheless, in many of those countries, the price of carbon remains below the most conservative estimates of the social cost of carbon. Moreover, a closer inspection of the implemented schemes shows that coverage (i.e. regulated emissions as a share of total GHG emissions) is, in all cases, partial and, in most cases, modest (the highest coverage is found in Quebec in 2015 – 85%).

Hence, the economy-wide price signal is significantly less strong than what might initially appear. We therefore propose an *effective (explicit) carbon price,* (ECP) that is a coverage-weighted price,as a more appropriate measure of the strength of the price signal created by a carbon pricing scheme in any given year. We construct this metric for all jurisdictions with carbon-pricing.

Next, we use this measure to shed light on the dynamics driving carbon-pricing policies. In particular, the present paper aims to provide a political economy explanation for the observed gap between actual (effective) and socially optimal carbon prices. The analysis examines the relationship between effective carbon prices and political and economic characteristics in an international panel of [191] countries/jurisdictions over the period 1990- 2012. In addition, specific attention is dedicated to the role of the electricity supply industry in influencing the level of the effective carbon price.

We argue that the process leading to any level of carbon pricing has two sequential stages, with the first stage to decide whether to introduce carbon pricing policy followed by a decision on the level.

The paper is organised as follows. The first section briefly introduces the reader to carbon pricing mechanism principle and developments. Section 2 reviews three relevant strands of literature. Section 3 briefly discusses carbon pricing (in theory and practice) and introduces the concept of Effective Carbon Price. Section 4 presents the hypotheses and data. Section 5 discusses the empirical methodology used in the analysis and the results. Section 6 concludes.

Keywords: carbon pricing, panel analysis, political economy, electricity sector

**Methods**

In line with the assumption that carbon pricing policy is a two-stage process, we adopt a two-stage empirical approach in which we first analyse the dynamics driving the decision to implement a carbon pricing scheme and, subsequently, the factors influencing the scheme’s price level.

Both stages involve panel regression analysis. The first one is a logit/probit regression whereas the second one is standard panel analysis. We use heteroskedasticity and autocorrelation consistent standard errors and investigate whether the results are consistent across the use of both (country-) fixed and random effects. Our dependent variable is the constructed effective carbon price and our explanatory variables can be grouped into three categories: political and institutional factors, economic, and electricity-market.

**Results**

First, with the exception of Sweden, none of the jurisdictions has an ECP that comes near to the (even most conservative) estimate of the social cost of carbon. Besides, contrary to what theoretical results recommend, there is no consistent increase in the ECP over time in any of the countries considered.

The odds of having a form of market-based carbon pricing mechanism in a country at a given point in time are positively influenced by the following factors: GDP per capita, the level of Democracy as well as membership of the European Union. The share of industry in a jurisdiction’s GDP, however, negatively affects it. The influence of the energy mix on the probability of occurrence of a carbon pricing mechanism is more complex. While the share of electricity (% of total) produced from coal does not appear to significantly influence the probability of existence of such a scheme, the share of electricity produced from gas and oil negatively affects the chances of having such a scheme in place.

Turning to the analysis of the ECP, we observe that GDP per capita positively influences its level. Hence, not only does a higher level of economic development increase the probability of having a carbon pricing mechanism but also increases its level. Furthermore, EU membership increases the ECP by about $3.2 to $4 /t CO2e (2014 dollars). The value added share of industry negatively affects the effective carbon price. Its impact is in the range of -0.05 to -0.06, indicating that a one-percentage point addition to the share of industry in a jurisdiction’s GDP reduces the ECP by $0.05 to $0.06/tCO2e (2014 dollars). The share of electricity produced by fossil fuels (either coal, gas or oil) does not significantly influence the level of the ECP.

**Conclusions**

The present study sheds light on key political economy factors explaining the presence and level of carbon pricing across the globe. At a time where several countries are implementing (or have recently implemented) such schemes, accurate understanding of these factors is of the essence. Our study shows that none of the countries introduced an economy-wide carbon price: carbon pricing has been progressive and started with the sectors least subject to carbon leakage. In addition, results show that the political and economic environment plays an important role in the introduction of carbon pricing schemes. Taken together, these results bear significant implications for future carbon pricing policies development.

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