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Economic and employment impacts of climate change mitigation policies in OECD: A general-equilibrium perspective[☆]

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ARTICLE INFO

Available online 12 September 2013

JEL classification:

D58
Q54
E24
H23

Keywords:

CGE model
Green growth
Unemployment
Carbon pricing

ABSTRACT

Using a computable general equilibrium model, this paper aims at quantifying gross domestic product and labour impacts of an illustrative greenhouse gas emissions reduction policy. Labour markets are first assumed to be totally flexible, climate policies impact negatively GDP and show relatively limited labour sectoral reallocations compared to last 20 years changes. The model is then modified to incorporate labour market imperfections in OECD countries. In this case, the production costs of mitigation policy are affected in two ways: first by introducing extra costs due to the increased unemployment that such policy may entail; second by creating the possibility of a double dividend effect when carbon taxes are recycled so as to reduce distorting taxes on labour income.

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1. Introduction: climate change mitigation as part of a green growth strategy

Achieving ambitious environmental goals raises important transitional issues, as OECD and emerging economies will have to adjust to new patterns of growth. In particular, the realisation of

[☆] The views expressed in this paper are those of the authors and do not necessarily represent the views of the OECD or of its member countries. The authors would like to thank Rob Dellink, Nathalie Girouard, Paul Swaim and Thomas Manfredi of the OECD for valuable comments as well as participants in OECD and ILO seminars for their remarks and the two referees. This document has been produced with the financial assistance of the European Union.

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a green growth agenda may translate into deep changes in the labour market that extend far beyond the creation of what are often labelled as “green jobs” (UNEP, ILO, IOE and ITUC, 2008). While there are a number of opportunities associated with green growth, there are also costs associated with the transition. These costs may be scattered across the economy, with a potentially heavy burden supported by “brown sectors” and local economies heavily dependent on these industries. Furthermore, reducing the environmental footprint of production will imply changes in technology, skill requirements and work organisation that occur along the whole value chain and thus affect the labour force very broadly. Both benefits and costs of a new growth pattern will be pervasive across the labour force.

But analysing and assessing the employment impact of green growth policies is not an easy task and a lot remains to be done in this area. A general equilibrium approach is required to capture the direct and indirect channels through which these green policies can reshape labour markets and create structural adjustment pressures. This requires developing evaluation tools that incorporate detailed specifications of industries into multi-sectored general equilibrium models, but also a detailed modelling of labour market behaviour. Because labour market policies and institutions vary widely across countries, and interact in complex ways with policies in other markets, it remains quite a challenge to introduce a thorough representation of labour market functioning in environmental models that are already complex and not easily-tractable tools.

Section 2 provides a brief (and highly selective) literature review of available studies that investigate the labour market implications of climate change mitigation policy, from both a theoretical and empirical perspective. As there is little historical experience with low-carbon and resource efficient growth from which lessons could be drawn, this section also highlights potential analogies to other recent drivers of deep structural changes in labour markets, such as the ICT revolution and globalisation, in order to provide qualitative insights into the potential challenges that lie ahead. Section 3 provides a quantitative illustration of potential labour impacts associated to mitigation policies. The very aim of this illustrative exercise is to highlight and illustrate the main transition mechanisms at stake, rather than examining all possible economic implications of a transition toward a low-carbon and resource efficient growth. Hence, this quantitative analysis is limited in scope, focusing on climate change mitigation policies. These policies put a price on carbon emissions, therefore shifting away resources from fossil fuel energy, which is one of the main concerns associated with green growth policies. As illustrated in OECD (2011), green growth policies cannot be restricted to mitigation policies, as there are other ways to promote energy savings and energy efficiency. Yet, most environmental policies consist in putting a price signal on environmental damages resulting from economic activity (IEA, 2012). In order to clarify some of the general equilibrium effects associated with the implementation of mitigation policies, such as emission trading schemes (ETS), illustrative simulation exercises have been conducted under the assumption of fully flexible labour markets, using the OECD computable general equilibrium model (ENV-linkages). In Section 4, real wage rigidities are introduced in the model in order to shed some light on the potential employment impact of mitigation policies, the adjustment mechanisms at stake and their order of magnitude. While the modelling assumptions retained for these short-run wage rigidities are quite rudimentary, they illustrate the extent to which the recycling pattern of carbon taxes revenues could generate both environmental and economic benefits, the so-called double-dividend. Section 5 is the conclusion.

2. Understanding the labour market implications of green growth: a work in progress

One of the difficulties encountered in analysing the labour market impacts of green growth is that there is so little historical experience with low-carbon and resource efficient growth from which lessons could be drawn. Similarly, economic theory does not provide much guidance in the absence of detailed knowledge about which mix of environmental policies will be implemented and which “green technologies” – including those not yet developed – will be of the greatest importance in decoupling production and consumption from harmful environmental impacts. Even when specific policies and technologies are being studied, great uncertainty remains such as how the scaling up and diffusion of cleaner production technologies will affect the composition of labour demand, including

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