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The importance of the regional/local dimension of sustainable development: An illustrative Computable General Equilibrium analysis of the Jersey economy

D. Learmonth [a], P.G. McGregor [b], J.K. Swales [b], K.R. Turner [a,*], Y.P. Yin [c]

[a] *Fraser of Allander Institute, Department of Economics, University of Strathclyde, UK*
[b] *Fraser of Allander Institute, Department of Economics, University of Strathclyde and CPPR, Universities of Glasgow and Strathclyde, UK*
[c] *Department of Economics, Social Sciences and Tourism, Business School, University of Hertfordshire, Hertford, UK*

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Abstract

This paper uses a multi-period economic-environmental Computable General Equilibrium (CGE) modelling framework to analyse local sustainability policy issues. Our focus is the small, open, labour-constrained regional economy of Jersey. The case of Jersey is of particular interest for two main reasons. The first is the unusually low degree of geographical labour market integration for such a small regional economy. This motivates our treatment of labour as a region-specific factor of production. The second is the availability of high quality, Jersey-specific economic-enviromental data. We employ CGE model simulations to track the impact of changes in population on a number of energy-consumption and pollution indicators in a recursive dynamic framework under alternative hypotheses regarding economic conditions over the time period under consideration. In the case of Jersey, we find that household consumption is the key factor governing the environmental impact of economic disturbances. Therefore the analysis includes an examination of the sensitivity of the simulation results to different assumptions affecting the wage elasticities of labour demand and supply,

* Corresponding author. Department of Economics, University of Strathclyde, Sir William Duncan Building, 130 Rottenrow, Glasgow G4 0GE, UK. Tel.: +44 141 548 3864; fax: +44 141 548 4445.
E-mail address: karen.turner@strath.ac.uk (K.R. Turner).

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and the speed of adjustment to equilibrium on the responsiveness of household income to shifts in labour supply.
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1. Introduction

The 'Rio Declaration' and Agenda 21 agreements of the 1992 Earth Summit (United Nations, 1992) stimulated considerable interest in modelling the impact of economic activity on indicators of sustainability and assessing the economic costs of reducing that impact.[1] While the problems of sustainability in general, and climate change in particular, are inherently global, a number of sub-global models have been developed to examine these issues. Many of these models have been constructed for national or regional economies that are small relative to the rest of the world, even though the impact on global sustainability of any change in activity in such target economies is likely to be trivial.

One of the reasons for modelling sustainability issues in a small economy context arises from commitments to international agreements such as the Kyoto Protocol on reducing CO_2 emissions. These commitments place constraints on economic activity at the national or regional level. Modelling the impacts of national policies to reduce CO_2 emissions has been tackled at the national level by Bergman (1990, 1991), Stephan et al. (1992) and Böhringer and Rutherford (1997) and at the sub-national level by Conrad and Schroder (1991, 1993), Li and Rose (1995), and Kamat et al. (1999).

A second reason is that, even if the concern is solely with global sustainability, in many countries, regional authorities have sufficient discretion over aspects of economic and environmental policy to ensure that national policies can only be delivered with their co-operation. In fact, one of the key elements of the Agenda 21 framework is the understanding that because many sustainability problems and solutions "have their roots in local activities, the participation and co-operation of local authorities will be a determining factor in fulfilling its [Agenda 21] objectives" (United Nations, 1992, p.233). In the case of the UK, a significant degree of responsibility for setting and achieving sustainability objectives has been devolved to the Scottish Parliament, the National Assembly for Wales and the English Regional Development Agencies.

Finally, for sub-national levels of government, sustainability objectives are likely also to reflect a wider concern for quality of life values that apply to the local economy, rather than indicators that feature in global sustainability debates. For example, there may be fears for the impact on local public health from pollution generation, even if the type or level of emissions does not conflict with any international agreements to which the nation or region is a party.

We use the Jersey economy to illustrate the importance of the local/regional dimension of sustainability. Jersey is the largest of the Channel Islands, situated about 100 km south of the British mainland. It is a crown dependency of the United Kingdom and its economy is very closely integrated with that of the UK, sharing its language, currency and interest rates. The choice of Jersey

[1] For example, shortly after the Earth Summit, the OECD Model Comparisons Project examined the properties and predictions of GREEN, a multi-region global CGE model (Burniaux et al., 1992), and five other global models in assessing the economic and environmental costs and benefits of various programmes to reduce international CO_2 emissions (Dean and Hoeller, 1992).

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