

Public Investment and Regional Economic Development

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In Memoriam

Moss Madden

Moss Madden, who tragically died after a short illness contracted a few days before the Jerusalem Regional Science Symposium in February 2000, was a leading figure in planning education and regional science research whose reputation extended throughout the world. Based in the Department of Civic Design for almost thirty years, he pursued a highly successful academic career at the University of Liverpool which took him to the top of his profession.

Although he was not a native of the city, Moss spent the whole of his adult life in Liverpool. He chose initially to study civil engineering at the University, before deciding on a career in planning. In 1970 he took up a place on the Master of Civic Design course, attracted by the prospect of studying planning in a stimulating, multidisciplinary environment. Like several of his contemporaries, Moss opted to specialise in quantitative planning techniques. Upon graduating, he accepted the offer of a university research assistantship to study simulation modelling. This was the first step on an academic ladder which led, eventually, in 1993 to the award of a Personal Chair in Planning and, four years later, to the Headship of the Department of Civic Design.

Most of Moss's research was in the interdisciplinary field of regional science. It involved fruitful collaborative work with economists, geographers and mathematicians, as well as with other planning academics. First with Peter Batey and later with others including John Dewhurst, Geoff Hewings, Andrew Trigg, Yoshio Kimura and Michael Sonis, he developed new approaches to demographic-economic modelling which allowed regional population and economic change to be analysed (and predicted) within an integrated framework based on extended input-output analysis. Subsequently he went on to explore new types of impact multiplier and to examine the relationships between Extended Input-Output Models and Social Accounting Matrices and Computable General Equilibrium Models. This fundamental and original research received widespread recognition in North America, Japan and Australia, as well as in Europe, and formed the basis of his

international reputation. It led, in recent years, to more applied work where the new models were used as part of socio-economic impact assessments of large infrastructure projects such as airports and barrages. In fact, one of Moss's last publications was a volume of invited essays on *Regional Science in Business*, edited jointly with Graham Clarke. The book focuses on a wide range of practical applications of regional science methods.

The outlet for many of the papers Moss produced was the Regional Science Association, with its supranational groupings in Europe, North America and the Pacific, and national sections throughout the world. Moss was a key figure in the British and Irish Section, serving as chairman in the mid-1990s, organising conferences, editing proceedings, and generally providing strong academic leadership. He greatly valued the international links that the Association provided and showed himself to be an enthusiastic and highly effective networker. Moss had exceptional organisational and administrative skills which he put to good use in the various facets of his work. He was particularly proud of the productive links he helped to establish between British and Israeli regional scientists, reflected in several highly successful joint meetings in the two countries. Those of us who worked with Moss, in Liverpool and in many other parts of the world, will greatly miss his sharp, incisive mind, breadth of vision and understanding, warm companionship and sense of fun. The regional science community has lost a remarkable leader, scholar and friend.

Peter Batey

Lever Professor of Town and Regional Planning

Dean of the Faculty of Social and Environmental Studies, University of Liverpool

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1. Introduction

Daniel Felsenstein, Ronald McQuaid, Philip McCann and Daniel Shefer

The relationship between public investment and regional economic development is of perennial interest to researchers, policy makers and students. Public investment is often seen as a possible method for 'jump-starting' lagging regional economies and allowing them to catch up. Therefore a key issue is the need to re-assess the relationship between public investment and regional growth. One fruitful avenue of investigation that has emerged from this interest has been the development of Endogenous Growth Theory and its application to regional economic development (Nijkamp and Poot 1998; Martin and Sunley 1998). By stressing the endogeneity to the growth process of those factors traditionally treated as exogenous in neoclassical models (such as human capital and technology), this approach underlines the way in which some regions create an internal mechanism for promoting or perpetuating their growth. Endogenous growth can thus be a self-reinforcing process whereby knowledge and skills are continuously embellished and the region's competitive base is enhanced.

Public investment in physical and human capital may be one way of facilitating the development of increasing returns and spillover effects, the hallmarks of endogenous regional growth. Allocating public funds to improving the regional knowledge infrastructure and upgrading the level of local human capital is often perceived as likely to set in motion those forces that result in regional growth. The question arises, however, as to the exact form of public investment ('hard' or 'soft') and its method of delivery ('direct' or 'indirect'). 'Hard' public investment refers to public allocations to physical and capital stock such as buildings, equipment and especially public infrastructure such as roads and transportation networks. Conventional wisdom is that the public provision of these investments will allow lagging regions to mobilise production factors more efficiently, thereby realising their full potential (Aschauer 1989; Biehl 1991). Empirical evidence of this effect however, is far from conclusive (Button 1998).

'Soft' investment refers to public involvement in developing human resources, business support services and a region's innovation and entrepreneurial base. Again, the commonly-held perception is that this form of investment complements public support for hard infrastructure. The rising stock of productive assets in a region and increasing capital and labour productivity can be further enhanced by raising the skills and competencies of the local labour force and by assisting the creativity and resourcefulness of entrepreneurs through business support systems (Townroe and Mallalieu 1991). As this kind of infrastructure investment is of a more ephemeral nature, assessments of its relative effectiveness are piecemeal. While studies that look at the impact of public investment in particular support programmes do exist (for example, Marshall et al. 1993; Smallbone et al. 1993), these are generally individual and non-comparable case studies employing an array of differing methodologies and foci. As such, we still know relatively little about the aggregate regional effects of public investment in 'soft' infrastructure.

While both 'hard' and 'soft' public investment aim at reducing costs to producers, the main issue at stake from a regional economic development perspective is whether the benefits arising from this investment are appropriated solely by these recipients or whether they also filter through as externalities and spillovers to the wider regional economy. This is further underscored by the method of delivery of public investment. On the one hand this investment can be 'direct', that is delivered through the producer, household or individual in the form of business subsidies, tax concessions, transfer payments or training schemes (Fisher and Peters 1998). On the other hand it can be 'indirect', in the sense that it is aimed at creating an aggregate change in a region through the provision or subsidy of roads, communications networks, schools and higher education institutions (Bartik 1991). The benefits of these investments are not solely internalised by the individual firm or household.

Of course, these categories are not mutually exclusive and are all interconnected with each other. Public investment in road infrastructure or in industrial R&D may at the same time benefit both the individual firm and the wider regional economy. The main question would seem to be which of the alternative approaches generates a higher rate of return in the region and enhances local productivity more efficiently. While this has been dealt with in terms of 'hard' public investments such as roads (Aschauer 1989; Biehl 1991), much less is known about softer forms of investment such as public support for education, training and business assistance.

This volume does not try to conclusively solve these issues. It does, however, present a variety of perspectives on public investment and regional economic development and analyses a range of types of investment, from

transport and housing infrastructure to education and innovation. Regional growth and competitive advantage are based on overlapping factors, which relate to dynamic connections between infrastructure, capital and labour and so on. These factors include: flexible production and specialisation; capabilities to develop and utilise new technologies (products and production processes); competition with rival firms and pressure from customers; specialised suppliers and factor inputs such as labour; agglomeration economies and economies of scale (as discussed by Marshall over a century ago); and dynamic inter-industry clusters. The networks of formal and informal relations between organisations can be important for regional growth and small business formation, as are the development of human capital and the operation of labour markets, public institutions and the creation of knowledge and other resources. Hence regional policies and public investment in regions need to take account of this wide range of complex factors and their inter-relationships.

The four parts of this volume address the various forms in which public investment can impact on regional growth. Echoing the recent influence of both endogenous growth theory and the burgeoning literature on the role of infrastructure in contributing to regional convergence or divergence (Button 2000), the three empirical parts of the book deal with innovation and knowledge creation, human capital and physical infrastructure. The first part deals with the tools of analysis of regional economic change and with policy lessons arising from past experience. In this part, two chapters suggest extensions to input-output analysis, the workhorse model of regional analysis. A further chapter revisits the notion of 'regional economic planning', discussing policy failures due to misdirected emphases, uncritical reliance on conventional wisdom, and unwillingness to consider alternative approaches.

The second part considers the central policy issues of innovation and knowledge creation. These are increasingly recognised as key endogenous factors in regional economic growth. In most advanced economies, public investment in innovation and technology attempts to influence the rate and direction of technological change and, in some cases, tries to steer this growth into particular places. The part considers the way in which innovative activity impacts on regional growth and examines the efficacy of the public policy instruments that have been used.

A further factor promoting endogenous regional growth is human capital. Ever since the seminal work of Lucas (1988), public investment in human capital has been acknowledged as generating spillover effects that increase the productivity of the general labour force and of the regional physical capital stock. Part Three illustrates the complex nature of the relationship between human capital investment and regional labour markets. The chapters

consider the links between human capital gains and employment changes, both within regions and between regions, from different perspectives.

Part Four considers the role of investment in physical infrastructure, long seen as both a cause and a consequence of economic development in a region. Infrastructure investments are often considered to be a stimulant for promoting self-perpetuating growth in a region. In this respect endogenous growth theory is linked to investments in regional infrastructure endowments. Four chapters consider the importance of road, housing and building infrastructure for regional development, using a range of models and techniques to explore the complex two-way interaction between investment and economic behaviour.

Taken together, the chapters in this book combine to increase our understanding of the relationships between public investment, regional economic development, and the behaviour of individuals, firms and governments. The approaches and techniques employed here point to ways of furthering our understanding of the inter-relatedness of these issues. A sound understanding of this relationship is necessary to ensure that public policy can be effective as a means of promoting regional development. Some answers are provided but, of course, many new questions arise. As addressed in the individual chapters, there still remains a need to further develop our models and techniques.

The origins of this book lie in the Israeli-British and Irish regional science workshop that was held in Jerusalem in February 2000. This was the third in a series of bi-national regional science meetings involving these two sections of the Regional Science Association International that began in 1990. Moss Madden was a key figure in promoting these seminars and had been intimately involved in the organisation of each one. Unfortunately, he was unable to attend the Jerusalem meeting that he had helped arrange and sadly passed away the day after the workshop ended. This book is a modest tribute to his foresight and vision in promoting international regional science linkages and cross-national collaboration.

The Jerusalem workshop was made possible due to the support of the British Council; the Israeli and British-Irish sections of the Regional Science Association International; the Authority for Research and Development, the Faculty of Social Sciences, the Institute for European Studies and the Levi Eshkol Institute for Economic, Social and Political Research - all at the Hebrew University of Jerusalem; the School of Management at Ben Gurion University of the Negev and the Sego Fund at the Technion-Israel Institute of Technology.

Co-ordinating a volume comprising fifteen chapters and twenty-three authors is never an easy task. We would like to thank Michal Stern for her sterling work in converting multiple manuscript files into one standard format