

Introduction

Bernard Fingleton

The body of theory known as new economic geography (NEG) is first and foremost an outcome of the creative imagination of economists and not geographers, although one could easily be misled by the name commonly attributed¹ to this branch of economics. Indeed, it is not stretching the truth too far to claim that it is primarily a creation of a 'single' cohort of prominent economists,² the most notable among them being Paul Krugman, and it is in part due to Krugman's status that the economics profession sat up and took note of this new development in economic theory, which is rooted in the theoretical systems of mainstream economics, particularly international trade theory, in which Krugman and Venables in particular have substantial reputations. As one might expect, this reinterpretation of what economic geography is, should or could be, sent shock waves throughout the community of economic geographers proper, and invoked some ardent criticism from within the geography profession. Probably the most prominent and notable critique, which received widespread coverage in a popular economics magazine³ with a global circulation, was that of Ron Martin (1999), a geographer here at Cambridge, whose often cited work lists many of the limitations of this new approach to economic geography. Within the economics profession itself, not everyone was happy with the new turn of events, which put space centre stage in a way that had never before been possible. For example, there was serious criticism of the theoretical assumptions underpinning the NEG by Peter Neary in his article written in 2001.

None the less, and because of or despite these limitations, NEG has spurred both geographers and economists to new heights, in some cases to develop modifications to the theory so as to circumnavigate the criticisms that have been made, in other cases as a reaction to their concerns with what NEG has to offer and the direction in which it is steering. For others it is because NEG is viewed as a new and exciting sub-discipline of economics, despite the protestations of geographers and others that it is something of a reinvention of the wheel, albeit with extra analytical rigour and formalism. An outcome of all this activity is a revitalization of the interface between geography and economics, with new theories and analytical methods

coming on-stream fast in the literature. Books have been published that attempt to see a way forward for economic geography, most notably *The Oxford Handbook of Economic Geography* (Clark, Feidman and Gertler, 2000), which is written principally from the geographers' perspective, whereas, for instance, *An Introduction to Geographical Economics* and the *Handbook of Urban and Regional Economics, Volume 4* (Henderson and Thisse, 2004), have a fairly exclusively economics emphasis. New journals have been established. *The Journal of Economic Geography* is dedicated to establishing a dialogue between geographers and economists, and more recently *Spatial Economic Analysis*⁴ has been inaugurated jointly by the Regional Studies Association and the Regional Science Association (British and Irish section), with a focus on spatial economics and spatial econometrics.

This book is a constructive contribution to this interactive process: it is written by sympathetic and open-minded economists interested in economic geography, economists who were also trained as economic geographers, and economic geographers proper, all of whom are broadly characterized as having a natural affinity to, or interest in, NEG, but who want to take our understanding of economic geography beyond the restricted perspective offered by current NEG theory and practice. Therefore, to some extent, the book can be seen as a constructive critique of NEG, wishing to take economic geography forward in new directions in the aftermath of the initial wave of theory, and which sees a continuing role for theoretical and empirical contributions to the science of spatial economic analysis. The intention is to offer middle ways that build on, rather than destroy, the advances made by NEG, by helping to tear down the walls and perhaps shake the foundations, and rebuilding in the light of collective experience, wisdom and insight. This was the tenor of some of my own recent papers (Fingleton, 2000, 2004), which called for a 'third way', a call that is echoed in the work of like-minded colleagues (for example, Rodriguez-Pose, 1998; Sjoberg and Sjöholm, 2002). Where this 'third way' parts company with many geographers is that it treats economic geography as an essentially scientific endeavour. By 'scientific endeavour' I mean collective action in which communicable theories are constructed, and ultimately rejected, transcending culture, language, time and space. Hence the preferred approach is to set up a clearly defined model, hypothesizing explicit relationships and interactions, in order to cast light on a complex reality. Where 'the third way' parts company with what remains of traditional NEG is the emphasis it gives to realism; in other words, important variables are not assumed away because they get in the way of formal modelling, but are incorporated because at the end of the day theory is about explaining reality, and is somewhat sterile and fairly useless when treated as

an end in itself. Useful theory leads to a model that will tell us what will, could or would happen at point X on the surface of the earth at time T; the more precise this prediction is, the more useful is the theory and model generating it. Although they had to start somewhere, much of NEG theory, as set out in the classic exposition by Fujita et al. (1999), is distinctly unreal and only potentially useful; much of this book tries to use, or evaluate the usefulness of, NEG theory. We therefore start with an introductory outline of some initial (unreal) NEG concepts in Chapter 1 before progressing swiftly in various new directions, as befits a book entitled *New Directions in Economic Geography*.

CHAPTER 1

Chapter 1 outlines some of the economic theory that underpins NEG, and illustrates the theory in two ways. One is a simulation that takes the reduced forms consistent with a simple version of NEG theory and attempts to apply it to the data for regions of Great Britain. On the whole the model works; it is possible to replicate reality even via this simple model, which assumes so much and excludes many of the very important variables that are known to determine, for example, wage rates. The data do seem to match the short-run equilibrium outcomes from the NEG model. This highlights an important direction for future research, which is that just because we can fit a model does not mean that the theory underpinning the model is true, or indeed it does not mean that the fitted model is superior to another (untested) model with a different theoretical basis, which may outperform the model in question. Hence the message we get from this 'successful' exercise in calibration is that we should not get too excited by a good statistical fit! The second example in Chapter 1 looks at the long-run rather than short-run dynamics of the NEG model, switching from the 36 regions of Great Britain to the much more manageable two: core and periphery. This artificial landscape evolves towards polarization or symmetry, depending on the conditions. The examples follow those in Fujita, et al. (1999), but with a different graphical flavour.

CHAPTER 2

This chapter raises the issue of observational equivalence between the two main classes of 'new economic geography' (NEG) models based on factor mobility and vertical linkages. The issue is illustrated in terms of two recent versions of those models, whose analytical solvability reveals that the two

classes share the same fundamental structure and therefore the same equilibrium properties. Accordingly, they lead to the same key empirical predictions. This calls for additional theoretical efforts to embed the two classes of models in richer set-ups where new endogenous variables react differently depending on which class is given the dominant role.

CHAPTER 3

This is a first attempt to fully test the NEG theory against a competing theory derived from urban economics. Both theories have much in common, for example, they are underpinned by the Dixit-Stiglitz theory of monopolistic competition, but they also differ. Most notably, the NEG theory has explicit transport costs and the urban economic theory has none. Both empirical models need to allow for additional covariates to obtain a reasonably good approximation to the data, which comprises nominal wage rates across 200 EU regions. The outcome is that the two competing hypotheses are non-nested, meaning that one is not simply a restricted version of the other, comprising a subset of its explanatory variables, and accordingly, the analysis uses a methodology appropriate to the testing of non-nested hypotheses. The principal finding is that NEG theory, as manifest in the reduced form equation, is no better than urban economic theory as a predictor of wage rate variations. In fact, the data supports both theories, without producing a knockout blow that dismisses one entirely, or allows one to be completely convinced by the other. Clearly, the version of NEG adopted here is not very adequate. This chapter is one of several that show NEG theory, on its own, to be of limited value as a realistic model.

CHAPTER 4

This chapter is an attempt to take estimates based on NEG models one step further. A crucial distinction between NEG and its predecessor, the new trade theory, is that (small) changes in the key model parameters can lead to (large) changes in agglomeration if an economy is close to the so-called break points. Once estimates of key model parameters are available, the question becomes what do these estimates imply in practice? Is it possible, for instance, to use the empirical evidence to find out whether or not the EU is close to such a break point at the current level of economic integration? The answer to this question is obviously important for policy-makers. The authors try to find an answer, and by doing so they also show how

difficult it is to answer this question. Their confrontation of NEG empirics with NEG theory points to some serious limitations of current NEG research.

CHAPTER 5

This chapter is divided into two parts. In the first part, the authors review the main results of a typical ‘new economic geography and growth’ (NEGG) model (Baldwin and Martin, 2003) and assess the contribution of this literature to the issue of long-run income gaps between countries. In the second part they discuss the robustness in some results of these models, which are directly linked to important policy implications, and they show that these results crucially depend on very restrictive values of some parameters of the model. In particular, depending on the different values of the degree of love for variety and the elasticity of substitution between traditional and manufacturing goods, their analytical examples reveal that: (1) when trade is costly enough the symmetric equilibrium might not be stable when capital is also perfectly mobile; (2) the rate of growth might depend on the geographical allocation of industries when spillovers are also global and, (3) when industrial firms are concentrated in only one region, countries might not grow at the same rate in real terms.

CHAPTER 6

This chapter focuses on the Achilles heel of NEG modelling: the assumption of iceberg transport costs. The main idea in the chapter is that iceberg transport costs are not a very realistic way to model transport costs, and yet are an essential element of NEG theory. The reason why they are unrealistic is that iceberg transport costs, as they are represented in explicitly spatial versions of new economic geography models, do not allow for any economies of distance and of scale in the transportation of either goods or information. Nor do they allow for possible variations in distance cost structures between inputs and outputs, and particularly those associated with information transactions costs. In contrast to the dynamics and equilibria that are the outcome of assuming iceberg transport costs, research on location production models suggests that stable locational equilibrium conditions are impossible with transport costs exhibiting economies of scale, even in conditions where transport costs exhibit economies of distance. Some progress is possible using alternatives, for example, a power function that at least captures economies of distance, calling into question whether

we are really ever going to obtain satisfactory empirical models with the NEG theory as presently formulated.

CHAPTER 7

This chapter investigates the relationship between the size of an area and the extent of its industrial specialization, pointing to the need for caution in drawing conclusions about NEG-related characteristics from aggregate regional data. Much recent literature in regional economics and NEG suggests that certain patterns of industrial specialization, and by implication, regional trade, will be empirically evident within the spatial economy. In particular, renewed theoretical interest in the role played by agglomeration economies in determining the patterns of regional specialization, has also led to the development of new empirical efforts aimed at identifying such agglomeration effects. However, a fundamental point that has been largely overlooked in the literature on agglomeration is the fact that the outcomes of these empirical exercises may themselves also be affected by our chosen spatial units of analysis.

As such, it is necessary to be rather cautious where empirical evidence is used to support theoretical arguments of agglomeration externalities. In order to discuss the relationship between the size of a region and its level of specialization, the authors analyse UK sectoral employment data at a variety of different levels of spatial aggregation. This allows them to distinguish the effect of regional size on measures of industrial specialization from those related to agglomeration economies. The overall findings of the analysis do confirm that regional specialization is indeed generally inversely related to the size of a region, as well as to the position of the area within the urban hierarchy. However, it is also necessary to be aware of the fact that this relationship is not only non-monotonic, but also that this relationship may be subject to the issues raised by the modifiable unit area problem. These results therefore require us to be very careful and cautious when interpreting empirical results of sectoral specialization and diversity as evidence of various types of agglomeration economies.

CHAPTER 8

The immediate target for criticism in Chapter 8 is not NEG per se but some of the assumptions and methods relating to the traditional neoclassical growth model, most notably that stemming from Barro and Sala-i-Martin's (1991) work on convergence, which 'has spawned a mini-industry of

research into cross-regional productivity differences predicated on a Solow-Swan type framework'. It is therefore, by implication, also critical of standard theoretical assumptions used in NEG. The authors argue that relatively little, if anything, is known about whether cross-regional differences in productivity growth in the EU are attributable to spatial differences in the efficiency with which factors are employed or spatial disparities in the rate of technical change. Indeed, the theoretical framework typically used as the backdrop for empirical research in this area assumes that all regions are technically efficient and that technology is a pure public good. That is to say, the framework typically used is an 'old' neoclassical growth framework that implicitly assumes that all regions are not only operating on their production functions, but that they share the *same* production function. This being the case, spatial differences in productivity are purely attributable to spatial differences in labour productivity emanating from differences in the capital intensity of production. Likewise, spatial differences in rates of productivity growth take the form of spatial differences in labour productivity growth attributable to different regions being in different degrees of (steady-state) disequilibrium.

To overcome some of these limitations, the chapter uses the non-parametric technique of data envelopment analysis (DEA) to calculate productivity growth using the Malmquist index of total factor productivity (MTFP) change, which is subsequently decomposed into indices of efficiency change and technical change. Analysis of these results reveals that over the crucial period of deepening EU integration, 1986–2002, the average region fell substantially further behind Europe's 'best practice' manufacturing frontier, recording a drop in relative efficiency of 24 per cent. It further reveals important spatial patterns in the distribution of the MTFP change index and levels of technical efficiency.

CHAPTER 9

Recent debates in economic geography have raised profound questions about the ways in which we both conceptualize spatial economic systems and use empirical evidence to support our explanations. Everyone agrees that we need to confront ideas with empirical evidence. But, there exists a broad range of views as to what this might mean in practice. Increasingly, and with varying degrees of success, theoretical claims are being confronted with empirical evidence using the tools of conventional spatial econometrics. Whilst sharing a commitment to mathematical and statistical reasoning, the authors put these tools to a different use. Their approach to understanding the evolving economic landscape emphasizes the self-destabilizing nature of

competitive dynamics in capitalist economies, raising the possibility of perpetual out-of-equilibrium spatio-temporal dynamics. While it has been possible to describe processes underlying this instability, empirical analysis of these theories has been scarce. In this chapter, the authors take a preliminary step in rectifying the paucity of econometric testing by outlining an empirical methodology that draws on, and extends, recent developments in the qualitative econometrics of non-linear dynamic systems. This involves extending and adapting the mathematical and statistical tools of symbolic and coding dynamics to complex spatio-temporal dynamics. When combined with a Bayesian model selection strategy, they argue that this permits the empirical comparison of some of the claims of NEG with those of *regional political economy*.

CHAPTER 10

This chapter reviews the literature on foreign direct investment (FDI) and tries to relate the empirical findings to theoretical structures, notably NEG. Numerous empirical results reveal FDI as a relevant and important aspect of economic reality that lacks a unified theoretical explanation. The chapter considers the possibility that NEG could help in throwing light on the mechanisms at work in FDI. Space – both in its physical and economic meaning – must play a decisive role in the decision made by firms about where they should locate or re-locate. Unfortunately, thus far, little effort has been made to incorporate something more than the flavour of NEG theory into FDI's theoretical and empirical framework. The suggestion is that future research should abandon the macro-view of FDI and focus on detailed firm-studies and micro-data, with a greater emphasis on the spatial elements, and that NEG should interplay more and more with trade theory to become more adaptable to the needs of FDI-related research.

CHAPTER 11

This chapter gives empirical evidence to support the view that even in the seemingly spaceless world of global information exchange, occurring at the speed of light over the Internet, with minimal transactions costs related to distance, proximity matters. While it may be true that as a result of the Internet, geographical proximity may matter less, what remains important is connectivity and language affinity. The chapter introduces the debate on the effects of ICT on the relevant notion of distance, either related to geographical or virtual dimensions, and discusses the role of trust and

reputation in situations characterized by repeated incomplete contracts, as is manifest in industrial districts. It also provides a brief description of the main forms of interconnection on the Internet, with a special focus on the nature of peering agreements. Then the authors discuss the rationale for observing agglomeration in the peering decision, and provide an econometric analysis of peering decisions within three relevant Euro-IX members' Internet exchange points. This is linked to NEG by the discussion of how ICT exerts two opposite effects on the agglomeration: a weakening of the centrifugal forces, and a shift in the centre of gravity of the centripetal forces, focusing agglomeration around virtual locations. Despite the seemingly almost zero transactions costs that seem to be an integral feature of the world of ICT, the authors conclude that, nevertheless, proximity matters. This is believed to be due to the role that proximity still plays in reducing the transaction costs of monitoring and punishing deviant behaviour, which is important within an industry where cooperation is essential for the efficient traffic exchange that is required for universal Internet connectivity.

CHAPTER 12

This chapter addresses the question, 'Why have the returns of European structural policies been below the ambitious goal of economic and social cohesion?' Interestingly, and in line with recent developments in the application of NEG, despite its largely normative and policy-oriented focus, the authors use an NEG theoretical framework as a backcloth to their explanation. They find that the excessive emphasis on infrastructure and, to a lesser extent, on business support, may be contributing to a greater concentration of economic activity in the core at the expense of the periphery, a trend that does not seem to be compensated by the positive returns from investment in human resources in a period of low labour mobility.

NEG models provide some potential explanation for this. Investment in transport infrastructure, in particular, is contributing to greater economic agglomeration, making any change to the present equilibrium situation somewhat difficult. Moreover, improving the transport infrastructure can itself be a reason for increasing agglomeration and disparities. NEG models show how infrastructure linking different regions usually tends to favour those regions endowed with a stronger productive fabric, and thus tends to further reinforce agglomeration. This also helps explain why expenditure in human capital, which is intended to provide local economies with better skills and overcome some of the endowment shortcomings of the periphery, has evidently been the only element of policy to provide significant and durable growth effects in Objective 1 regions.

NOTES

1. A less controversial alternative is 'geographical economics', as used in the book by Brakman, Garretsen and van Marrewijk (2001).
2. The authors of classic text, *The Spatial Economy: Cities, Regions and International Trade*, namely Masahisa Fujita, Paul Krugman and Anthony Venables.
3. *The Economist*, 11 March 1999.
4. I am the Editor.

REFERENCES

- Baldwin, R. and P. Martin (2003), 'Agglomeration and regional growth', *Discussion Paper 3960*, Centre for Economic Policy Research, London.
- Barro, R.J. and X. Sala-i-Martin (1991), 'Convergence across states and regions', *Brookings Papers on Economic Activity*, **1**: 107–82.
- Brakman, S., H. Garretsen and C. van Marrewijk (2001), *An Introduction to Geographical Economics*, Cambridge: Cambridge University Press.
- Clark, G.C., M.P. Feldman and M.S. Gertler (2000), *The Oxford Handbook of Economic Geography*, Oxford: Oxford University Press.
- Fingleton, B. (2000), 'Spatial econometrics, economic geography, dynamics and equilibrium: a third way?', *Environment & Planning A*, **32**: 1481–98.
- Fingleton, B. (2004), 'Some alternative geo-economics for Europe's regions', *Journal of Economic Geography*, **4**: 389–420.
- Fujita, M., P.R. Krugman and A.J. Venables (1999), *The Spatial Economy: Cities, Regions, and International Trade*, Cambridge, MA: MIT Press.
- Henderson, V. and J.F. Thisse (eds) (2004), *Handbook of Regional and Urban Economics*, North-Holland: Elsevier.
- Martin, R. (1999), 'The new "geographical turn" in economics: some critical reflections', *Cambridge Journal of Economics*, **23**: 65–91.
- Neary, J.P. (2001), 'Of hype and hyperbolas; introducing the new economic geography', *Journal of Economic Literature*, **39**: 536–61.
- Rodriguez-Pose, A. (1998), *Dynamics of Regional Growth in Europe: Social and Political Factors*, Oxford: Oxford Clarendon Press.
- Sjoberg O. and F. Sjöholm (2002), 'Common ground? Prospects for integrating the economic geography of geographers and economists', *Environment and Planning A*, **34**: 467–86.