
1. Introduction

The question and the pressing problem that has troubled economists and others since the 17th century is: why do some areas, regions or countries grow faster than others? Why is economic development unbalanced? Can economic development and growth be inclusive? If so, how? The spatial location of economic activity in the future is one of the most important and challenging questions in economics. It is not only relevant for the future location of jobs, their quantity and quality, but also because of the creation of profit, tax proceeds, exports, public expenditure, urbanisation, pollution and the like. Progress in technology, innovation, changes in demand and certain moves towards a liberal economic policy create new challenges for theorists, policymakers and business executives. As certain new and a number of old economic activities in manufacturing and services turn footloose, highly mobile, fragmentable and internationally connected, one of the most demanding and intricate questions in such a situation is where firms and industries will locate, relocate or stay?

Alan Greenspan, the former chairman of the United States (US) Federal Reserve Board, and a prominent policymaker, said to his colleagues: 'We really do not know how [the economy] works . . . The old models just are not working' (Beinhocker, 2006, p. 22). Or in the words of Beinhocker (2006, p. 6):

The economy is a marvel of complexity. Yet no one designed it and no one runs it. There are, of course, CEOs [chief executive officers], government officials, international organisations, investors and others who attempt to manage their particular patch of it, but when one steps back and looks at the entirety of the \$36.5 trillion global economy, it is clear that no one is really in charge.

The successful economic development model may not be transferred from country to country like flu. William Easterly argued: 'In sum, we don't know what actions achieve development' (Easterly, 2007, p. 331). Hence, economic development is a work in progress, both in theory and in practice. Mathematical models as replacements of reality may be useful, but only to an extent. Mathematical modelling of electrons or beams in physics is simpler than in economics. The reason is that the economy is a dynamic, non-linear, adaptive and evolving complex system. Unlike electrons or beams, agents in economics have both foresight and strategy. Perpetual novelty and changes in technology, behaviour, institutions, natural and political environment, absence of global controller, endemic absence of equilibrium . . . sometimes mean that econometric models and their results as guides to policymakers stand on shaky legs.

Hence, the time is ripe regarding economic theory to try something different from the past and to move on. The objective of the new evolutionary turn in economics is not to downgrade or to demolish the traditional neoclassical equilibrium approach to economics. The neoclassical economic model will remain (at least as a starting point in education), as it contains certain basic facts on how the economy works. It is classic and 'beautiful', as are the works of Dante, Shakespeare or Vermeer. The goal of evolutionary economics is rather to offer a new research agenda that may prove that economics can do much better

than before. The problem is that economics is well known as a field that is notoriously slow to accept new ideas and theories, hence these new ideas may have a bigger impact only in the decades to come. Another difficulty is that economic complexity and evolutionary economic geography is still only a research agenda, as a cohesive theory is still far away in the future. Hence, it may sometimes be hard to evaluate progress in analytical work. The objective is to offer a new time-related insight into the economy as an open, complex, dynamic and adaptive system, especially for the creation of new missions.

Having this in mind, the approach taken in this book is conceptual. The modest objective is to find, clarify and explain key tendencies rather than to provide definite answers. After all, the evolutionary perspective considers random events and is loaded with the 'nobody knows principle'. It is a complex process which demands complex and context-specific explanations (hypothesis, network of interactions).

Evolutionary economic geography studies how the economic landscape changes because of endogenous forces; how relatively small changes within the system produce the transformation of the entire structure; how certain novelties shape the economic space; the impact of path dependence and lock-in effects; and the role of self-organisation in the creation of wealth.

The spatial location of a firm is an issue only in an imperfect market. In the absence of both economies of scale (no sunk costs) and transport costs (so that location in space makes no difference), the decision as to where to locate production would be easy. With no market imperfections, firms may be divided into units of any size and operate in all locations without any cost disadvantage.

What orders and directs an economy and its spatial distribution of activities? How is this done? Where does it go to? Views and arguments about these forces are divisive and different. Some consider that it is the price system that handles a complex system such as an economy.¹ Others prefer conscious action by economic agents and institutions, yet others are impressed by innovations (creation of heterogeneity) of all kinds. As an end point of economic activity, the neoclassical economic theory looks at a general equilibrium. Conversely, an evolutionary model is open to an ever-changing and never-ending dynamic process of transformations in an environment of disequilibrium and strong endemic uncertainty.

Economics is passing through one of its most important turning points for a century. The current evolutionary approach to economics offers the possibility for a change and an alternative to the traditional neoclassical equilibrium theory. This is still a work in progress, and an opening for a change in how one thinks about economics. It is a chance for a change of the traditional equilibrium framework of thought.

The evolutionary turn in economics is introducing a much wider openness to other disciplines than was the case just a few decades ago. In the 1970s, economists thinking aloud outside the framework of neoclassical equilibrium theory and its models were rare. Even today, they are not too numerous. It is difficult to publish an article or get a faculty tenure if your work is outside the neoclassical framework. Nonetheless, certain

¹ A bubble is an interesting price-related phenomenon. Values and prices are detached as buyers expect that they would be able to sell quite soon at the higher price what they buy now, no matter the market fundamentals. As soon as the pool of the new buyers willing to purchase the same asset at an even higher price is depleted, the bubble bursts. The last buyer (fool) is the one who is the loser in this gamble.

interdisciplinary conversations take place. The purpose of this book is to contribute to this cross-disciplinary discussion about the spatial location of firms and industries within the evolutionary framework.

A relentless search for profits in a market economy never leaves the economic system and its participants in stasis. New goods, services, jobs, firms, industries, clusters and production and management technologies are being created, while old or obsolete ones are modified or they vanish. This ceaseless 'creative destruction' of and within the system makes the economy evolve over real time. Hence economic evolution is linked with always changing and never-ending innovation and disequilibrium within the economic system. Therefore, the challenge in economic policy and business is not necessarily to optimise (is that possible in endemic disequilibrium?) nor to adapt actions within the given constraints, but rather to alter constraints.

The objective of economic geography is to study and explain the puzzle of the unequal spatial spread of economic activity: who starts economic activity; why; where; how does it emerge, evolve, improve, transform and die? What are the forces that determine the nature of spatial distribution of economic activity; how and why do they interact? Why do various agglomerations of economic activity exist and persist in space? Why is their distribution uneven? Why does the productivity of firms increase in agglomerations? Is there a limit to the boost in productivity in agglomerations?

Economic geography was a rather sleepy academic backwater area in economics for a long time, not because it was uninteresting, but because problems such as the enigma of unequal economic development seemed intractable. Although important works in the location theory were available for over a century, the introduction of 'new' analytical tools in the new economic geography such as:

- economies of scale;
- path dependence;
- imperfect competition;
- threshold effects (agglomeration rents);
- home market effects; and
- trade and transport costs

during the 1980s provided a new theoretical springboard for the study of the subject. In essence, economic geography attempts to link two (formerly separate) fields in economics: location theory and the theory of international trade.

Evolutionary economic geography studies the economic landscape, its origin, changes, direction and speed in the spatial distribution, organisation and behaviour of production and consumption in a time perspective. It analyses the unfolding of dynamic changes in the economic landscape such as the genesis of firms (creation, growth, transformation, decline and exit) and industries in clusters, cities and regions. Agglomeration with its externalities, links in production, clustering, innovation and the role of institutions are at the heart of this exploration. Instead of general one-size-fit-all models, evolutionary economic geography emphasises context-specific factors and often relies on case studies. This field of academic enquiry is multidisciplinary par excellence. It is not (yet), however, based on a general theory or even a widely accepted system of methodologies and rules. Certain ambiguity in the exact meaning of evolutionary economic geography still persists

as it is an umbrella under which one may find an abundance of various lines of enquiry. Hence, this work in progress offers wide, uncertain, but potentially rewarding possibilities for deeper research and analysis.

Economic geography aspires to analyse and describe economic changes, tendencies and their reasons in physical space. It considers the widest array of geographical locations. All societies and market-oriented firms must decide what, for whom, how and where to produce. My concern in this book is linked with the spatial 'where' part of this decision-making process. In this complex situation, the crucial questions for research, analysis, business decisions and economic policy include the following:

- Where will economic activity locate (and stay) in the future?
- What are the dynamics of the development and growth processes?²
- Are these processes deterministic or unpredictable? Are they leading towards (a higher-level) equilibrium, or is it a perpetual, uncertain and unpredictable process?
- Why is production (and consumption) concentrated in urban areas or regions? Why do urban and other areas differ in size?
- What are the reasons for the uneven spatial distribution of economic activity and prosperity?³

² Growth in an economy is linked with quantitative changes, usually within one year, while development deals with qualitative changes in an economy and has usually a longer-term perspective (new production patterns, new entrants . . .).

³ The Gini index (Figure 1.1) compares the actual distribution of activities with an even (standard) distribution. It measures the degree of similarity or inequality in a distribution (for example, spatial location of

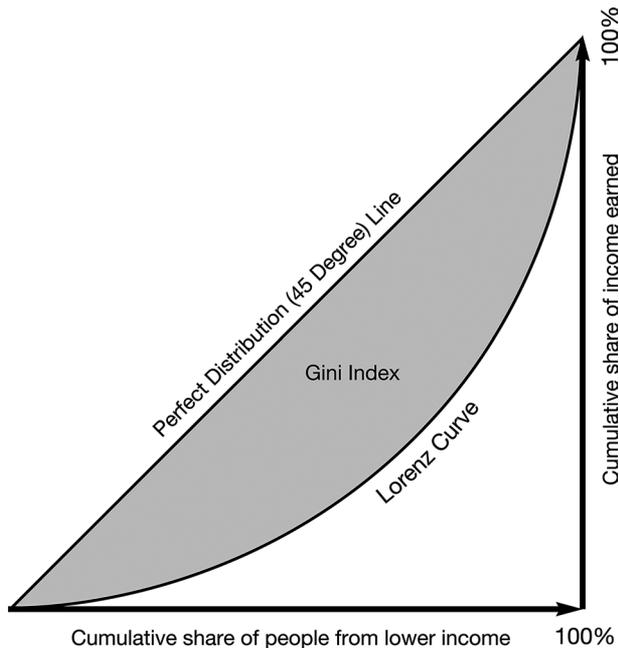


Figure 1.1 The Gini index

- Is it smart to keep the existing industries where they are? What is the opportunity cost for doing that?
- Does market expansion through international economic integration encourage agglomeration, clustering, spatial concentration of industries, adjoint locations of linked productions and ‘thick’ market effects? Or, alternatively, does agglomeration encourage economic integration?
- Does integration cause convergence or divergence in the geography of production, income levels and/or growth rates in the participating countries?
- How do these forces interact? Where do they lead the economy?
- What is the role and effect of public policy (intervention)?
- What are the current and future properties of economic adjustment (spatial and industry-wise reallocation of resources) to the changing situation?
- Where will ‘hot’ and ‘cold’ spots for the location of business be situated?
- Who will benefit from these developments?
- Why are certain areas more economically successful than others?
- What are the background forces for success, decline and failure?
- What triggers and keeps economic activity in select areas?
- What is the role (if any) of economic policy?
- Is agglomeration (cluster) necessary for economic prosperity?
- What is more favourable for the economic success of a city or a region: specialisation or diversification?

These are all important and difficult issues to analyse and resolve.

Evolution is a process of unfolding, self-transformation, self-organisation after oscillations and the appearance in orderly succession of events over a long period of time. Complex organisms and systems are created through a long process of incremental changes. This process is irrevocable and can never be repeated. Hence, ‘In a nutshell, complex systems arise spontaneously, behave unpredictably, exhaust resources and collapse catastrophically’ (Rickards, 2012, p. 196).

Complex systems (the human body or the atmosphere and weather forecasts) may be contrasted with a complicated system. A mechanical Swiss watch is complicated, but not complex. Complex systems have individual components that are connected and interdependent.⁴ Action of one part may trigger reactions of other parts.⁵ Those parts

firms or income). This index is a ratio of the area the Lorenz curve of distribution and the curve of the uniform distribution. Zero measures perfect equality, while perfect inequality corresponds to 1 (one region has all the firms or one person has all the income). Applied to the spatial concentration of firms, this index does not take the size of firms into account. Some industries may be organised in a few large firms (chemicals, finance, car assembly), while others may be composed of a number of small firms (food, textiles).

⁴ Complex systems such as earthquakes, tsunamis, storms or eruptions of volcanos are natural designs; global warming has a mix of natural and man-made sources; while stock markets are human constructions.

⁵ A snowflake (the last one) may trigger an avalanche. This may be when a fake news (rumour) about insolvency of a bank triggers a run by depositors on that bank to get their savings all at the same time. For instance, during the global financial crisis of 2008 subprime mortgage losses were less than \$300 billion, but when derivatives are included, total losses were over \$6 trillion. To reduce the risk of grand collapse and to increase robustness, the system needs to be reduced in size so that no component may grow too large. ‘Instead US banks are bigger and their derivative books are larger today than in 2008. This makes a new collapse, larger than the one in 2008, not just a possibility but a certainty. Next time, however, it really will be different . . . the

and the whole also have the potential both for adaptation and for collapse. A rumour (fake news) that a bank is unsafe may ruin the bank. Fake news may instigate a run on the bank by most of the depositors, to demand their savings all at the same time. The initial fabrication of fake news may turn out to be true. The whole in a complex system is more than the sum of its parts.

Complexity and evolutionary economics deals with the actions, reactions, competition among various expectations, strategies and whims of economic actors. It is also concerned with the phenomenon of how these fit into the aggregate out-of-equilibrium and always changing picture. Having this in mind, relations between economics and evolutionary biology were known and recognised a long time ago. However, these interactions were put aside by many researchers in the field of economics.

Evolutionary economic geography deals with the evolution of economic units (such as firms, industries, clusters, cities, regions, states and integration arrangements among states) in geographical space. It considers not only their location and relocation in physical space, but also their creation, operation in the market, growth and demise over time. Where, for instance, a firm moves in business and in space, depends on the starting position: where its location was and how it was created. Hence history and expectations may assist in the explanation and comprehension of the (likely or wanted) future.

The evolutionary economic geography differs from the traditional model in several important dimensions. The new evolutionary model makes the case that production specialisation in a given locality is based not only on certain local comparative advantages, but also on a self-reinforcing lock-in effect, path dependence, accumulated knowledge, agglomeration, clustering and linkages (indivisible production). In addition, while the traditional models reason that a reduction in trade costs among locations may favour local specialisation, the new evolutionary economic geography claims that the effect on local specialisation is ambiguous. The final outcome is industry-specific and depends on the functional intra-industry production linkages, market structure, consumer preferences (homogeneity of tastes), factor market (availability and mobility of factors and flexibility in prices) and expectations.

Evolutionary and complexity economics is compounded with constant shocks, uncertainties and dynamics, as well as evolving changes on an immense scale. Persisting disequilibria are the 'big game in town'. One may feel uncomfortable with this situation, but the evidence against it is not convincingly presented. Evolutionary concepts consider economic changes in conditions of bounded rationality. It is a constant search for optimal solutions in conditions of scarcity, competition and endemic uncertainty. The process deals with creation, differentiation, selection (including mistakes), adaptation, innovation, retention, amplification, replication and constant search for creative-destructive optimal solutions in a pool of various and many possibilities.

Compared with neoclassical equilibrium theory, complexity and evolutionary theory of economic behaviour is another general and conceptual look at how the world works. This theory is concerned with:

next collapse will not be stopped by governments, because it will be larger than governments' (Rickards, 2012, p. 211).

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- uncertainty against which one cannot get insurance;
- (micro) analysis of endogenous technological change, innovation and their spillovers; and
- non-maximising behaviour of profit-oriented firms.

This introduction sheds light on the continuing importance of research efforts, public debate and the search for appropriate policy to face the challenges of spatial distribution of economic activity in the light of evolutionary changes. Part II proceeds with what theory says about evolutionary economic geography.