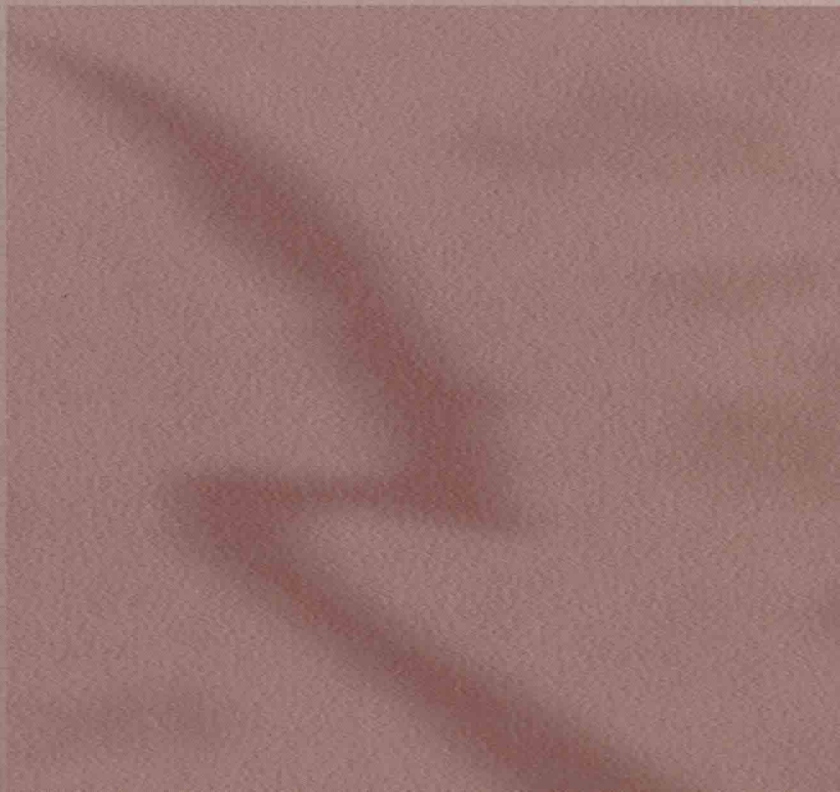
Economic Evolution

An enquiry into the foundations of new institutional economics

Jack J. Vromen



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PREFACE

This book is a modified, extended and updated version of my dissertation *Evolution and Efficiency* (University of Amsterdam, June 1994). What started all this was my fascination with the relation between realism (as a doctrine in contemporary philosophy of science) and economic science. Although there is a variety of philosophical positions captured under the rubric of 'realism', it seems that they all share the basic supposition that science primarily aims at formulating true, explanatory theories. I was led by the intuition that Milton Friedman's well-known though controversial statement that 'the more significant the theory, the more unrealistic the assumptions' (Friedman 1953: 14) could not be the last word on the subject. At the same time I felt that it would not make sense to superimpose some preconceived philosophical notion of realism on economic theories. If a meaningful connection between realism and economic theories were to be found at all, it would have to square with the self-understanding of practising economists. Indeed, I took this latter requirement to be so important that many, if not all, of the discussions in my dissertation were meant to articulate ways in which economists conceive of their own theoretical endeavours. With hindsight, it must be admitted that as a consequence the realism issue somewhat got out of sight. I thank Tony Lawson and Brian Loasby (as well as several anonymous referees) for alerting me to this. I hope that in the present book the balance is redressed.

I also owe special thanks to Neil De Marchi, who supervised the completion of my dissertation. He never got tired of following and encouraging my 'meanders' through the landscapes of economics, philosophy and biology. Many others have also been of great help to me. I would like to express my gratitude to all of them. In particular, I wish to thank Maarten Janssen, Huib Pellikaan and Herman Vollebergh for their careful reading and their penetrating though always constructive criticism of earlier drafts. I have benefited also from conversations with and comments from Armen Alchian, Marina Bianchi, Harold Demsetz, Sanjeev Goyal, J. Daniel Hammond, Jack Hirshleifer, Elias Khalil, Uskali Mäki and Philippe van Parijs.

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CONTENTS

1

INTRODUCTION

1. 'EVOLUTION' IN ECONOMICS: A BIRD'S-EYE VIEW

At the end of the nineteenth century, Veblen proclaimed the end of pre-evolutionary economics. Veblen argued that pre-evolutionary economists were inclined to think that economic events are bound to take a 'natural' course towards a putative equilibrium. In this course of events, 'human nature' was assumed to be unaltered. Veblen believed that the time was ripe for a fundamental reorientation of the discipline. Instead of postulating 'teleological' tendencies in the direction of 'normal' equilibrium situations, Veblen urged economists to develop an up to date, evolutionary 'matter-of-fact' approach. Economists would do better to study unfolding processes in terms of their causes and effects. According to Veblen, the key concept would have to be 'cumulative causation': causal processes engender effects that provide the starting point for subsequent causal processes, which in turn generate effects that provide the material for subsequent causal processes, and so on. Veblen argued that:

> for the purpose of economic science the process of cumulative change that is to be accounted for is the sequence of change in the methods of doing things – the methods of dealing with the material world.
>
> (Veblen 1898: 387)

Far from assuming an inert and immutable human nature, economists were to focus on changes in institutions, in habits of thought in economic communities. Veblen believed that institutions slowly adapt to changing 'exigencies' of industrial society, but he stressed time lags in this process of adaptation. Several institutions were identified by Veblen as hangovers from the past that were maladapted to 'modern' technological life.

At the beginning of the twentieth century, Marshall declared that the Mecca of economists lies in 'economic biology'. In the same spirit as Veblen, Marshall expressed the hope that prevailing statical analysis in economics would be a transitory state that would be superseded by a truly

dynamical analysis based on biological conceptions. The central idea of economics, Marshall held, had to be that of 'living force and movement'. Marshall argued that 'the struggle for existence' forces groups of people to change their customs and habits. Like Veblen, Marshall held that many habits survive which are in themselves of no advantage to the human race. Yet, on the whole, Marshall seemed to be convinced that those races survive in which the best habits are developed.

It is not entirely clear whether Marshall subscribed to Veblen's view that in an evolutionary economic theory equilibrium analysis would have no place. Marshall wrote that although 'equilibrium' suggests a statical analogy, really it is part of dynamic analysis:

> in fact it is concerned throughout with the forces that cause movement: and its key-note is that of dynamics, rather than statics.
>
> (Marshall 1920: xiv)

Marshall argued that the forces that are abstracted from statical analysis would have to be studied in an 'economic biology'. But he seemed to hold that the operation of these forces can be accounted for in terms of marginal analysis. As changes in market conditions are reflected in marginal costs, Marshall seems to argue, their effects can be analysed with the 'dynamical principle' of 'substitution at the margin'. This suggests that Marshall held that consequences of dynamical forces under changed market conditions can be accounted for in comparative statics as the replacement of an old by a new equilibrium.

Towards the end of the twentieth century, 'evolutionary economics' is gaining momentum. If the titles of newly appearing books, papers, journals and societies are reliable indicators of current trends in the economics profession, engaging in evolutionary analyses may even be called fashionable among economists nowadays.[1] Much of 'evolutionary economics' that has surfaced over the last two decades is part of, or has been inspired by, what has been labelled 'new institutional economics' (or 'neo-institutionalist economics').[2] 'New institutional economics' analyses *processes* in which *institutions* evolve (see Langlois 1986b). New institutional economists have put institutions firmly on the research agenda of economics. More and more economists appear to be persuaded that institutions matter to economic analysis. New institutional economics seems to be exempted from the 'teleological' overtones of the pre-evolutionary economics Veblen was fulminating against. The course of economic processes is not assumed to be predetermined in the 'nature of things', or to be designed by some divine Creator. Institutions are rather taken to be the unintended outcome of the behaviour of myriad interacting individuals.

Has Veblen's plea been answered at last? The above characterization of new institutional economics suggests an affirmative answer. New institutional economists appear to be doing just what Veblen urged economists to do:

analysing unfolding causal processes in which institutions are generated. But the merits of new institutionalist economics are vehemently disputed by the so-called old institutionalists who present themselves as the only legitimate heirs of Veblen. Old institutionalists criticize new institutionalists for sticking to dubious neoclassical presuppositions. New institutional economists are said to retain methodological individualism (see, for example, Dugger 1983). Institutions, old institutionalists argue, are taken by new institutionalist economists to be the outgrowth of individuals minding their own business. What is more, new institutionalists are said to view institutions as optimal solutions to recurrent problems individuals find themselves in (see, for example, Field 1984 and Mirowski 1986). Old institutionalists maintain that Veblen endorsed methodological holism. Veblen is said to have stressed processes in which the 'arrow of causation' is reversed. Instead of taking institutions to be the effects of the behaviour of atomistically acting individuals, as new institutionalists typically do, Veblen focused on the impact social institutions have on the behaviour of individuals by moulding their ways of thinking and handling things (see, for example, Neale 1987). In addition to this it is argued by old institutionalists that Veblen held that institutions tend to be maladapted to prevailing circumstances. Although Veblen believed that institutions adapt to changing environmental conditions, he emphasized that such processes of adaptation are slow and that time lags are to be expected.

Old institutionalists view new institutionalists as heirs of Marshall. One of the main thrusts of this book is that old institutionalists are right to some extent. The economic worlds of new institutionalists will be seen to be inhabited by individuals who, in the end (after having gone through some evolutionary process), behave *as if* they maximize their utility by equalizing costs and benefits at the margin. In other words, individuals populating new institutionalist worlds can be said to display 'Marshallian' behaviour. But new institutionalists are not heirs of the Marshall that old institutionalists have in mind: Marshall as one of the founders of neoclassical economics with its emphasis on individual 'rational choice'. If there is a Marshall that is the ancestor of present day new institutional economics, it is the visionary Marshall, the Marshall that envisaged the 'Mecca' of economics. To be more precise, their precursor is the Marshall who can be said to have hinted at an evolutionary reinterpretation of marginalist equilibrium analysis. A lot of preliminary 'groundwork' has to be done, however, before we will be able to draw this conclusion.

2. A DOWN-TO-EARTH PERSPECTIVE ON NEW INSTITUTIONAL ECONOMICS

The foregoing history of ideas from a bird's-eye view gives a neat and compendious overview. But its weakness is that it is too stylized. Too many

relevant facets are left out. For one thing, the use of the label 'new institutional economics' is far from unequivocal. Often-mentioned candidates for being labelled as such are Nelson and Winter's evolutionary theory, Williamson's transaction cost economics and Schotter's and Sugden's game-theoretic treatments of institutions. They can all be said to be concerned with 'evolution of institutions'. But 'institution' comprises many different phenomena. As we will see, Nelson and Winter focus on evolutionary processes in which routines of firms change. Williamson seems to be preoccupied with explanations of the replacement of markets by prevailing types of organization forms. And Schotter and Sugden analyse processes of spontaneous evolution in which institutions are established and maintained.

Differences between the candidates mentioned pertain not only to the notion of institution. They extend to the meaning of 'evolution'. Special attention will be paid to the notions of evolution that are involved in either candidate. Indeed, one of the major goals of the book is to get a clear understanding of what exactly 'evolution' may signify in economics. In ordinary language, 'evolution' refers to processes of *gradual* change and development (in contradistinction to 'revolution' that refers to disruptive radical change). In this book, 'economic evolution' will not be taken in the broadest sense of comprising all types of gradual change. A 'catchall' definition of 'evolution', such as 'evolution is the changing of something into something else over time' (Faber and Proops 1991: 59), fails to discriminate between different sources of change. One possible source of gradual change is the one that is accounted for in 'standard' neoclassical theory: instantaneous and optimal responses of all individuals to changes in an exogenous environment.

As we will see, in none of the 'new institutional' theories mentioned above is it assumed that gradual change is produced in this perfectly rational way. It is maintained that not all individuals are capable of making prompt and optimal responses. Proponents of new institutional economics hold that gradual economic change originates from other sources. At the other extreme, the definition of 'economic evolution' that will be given here is not so narrow as to exclude all other possible sources but one: technological innovation. Some 'evolutionary economists' seem to reserve the notion of economic evolution to denote transformations of technological 'regimes' or 'paradigms' (see, for example, Allen 1988 and Clark and Juma 1988). They seem to focus exclusively on endogenous 'variety-inducing mechanisms', mechanisms that continuously produce new innovations. A major source of inspiration here is provided by Schumpeter's work.

In this book this narrow definition of 'economic evolution' will be discarded too. New institutional economists will be seen to concentrate on selection mechanisms as sources of economic change. We will see that selection mechanisms tend to reduce rather than induce variety. Hence we

can say that the emphasis of new institutional economists is more on variety-reducing mechanisms than on variety-generating mechanisms. The notions of economic evolution that will be discerned in new institutional economics should therefore not be confused with those in 'evolutionary economics'. Indeed, if evolutionary economics is identified by an exclusive focus on variety-inducing mechanisms, this book is not about evolutionary economics at all.[3]

Selection mechanisms will be one of the main topics of this book. It will be argued that selection mechanisms involve *feedback loops*. Selection mechanisms are crucial parts of what will be called *evolutionary mechanisms*. On the basis of a selective though penetrating analysis of the theories mentioned, I shall distinguish between two evolutionary mechanisms: economic 'natural selection' and adaptive learning.

Another recurrent theme in the book is *levels of analysis*. It will be argued that in the theories under consideration, changes in higher-level aggregate phenomena typically are accounted for in terms of lower-level units of analysis. But what are aggregate phenomena and what are elementary units of analysis? Answers to this question again appear to differ from theory to theory. Nelson and Winter, for example, account for changes at the level of the industry. The elementary unit of analysis in their theory is the firm. Williamson's transaction cost economics seems to deal with phenomena 'one level below'. The evolution of organization forms is accounted for in terms of the endeavours of individuals. Here, the individual human agent is the elementary unit of analysis.

This multi-layered structure of theories can be observed also in evolutionary biology. It will be pointed out that Darwinian natural selection deals with evolution at the population level, thereby taking the individual organism as the unit of selection. Frequent excursions will be made into evolutionary biology. These excursions are meant to enhance our understanding of the peculiarities of evolutionary theorizing. One of the things that the present study intends to bring out is that economics and biology have much in common. Indeed, in my opinion the relation that economics has with biology is at least as intimate as its often-discussed relation with physics (see, for example, Mirowski 1989). This is first of all reflected in an unceasing cross fertilization of ideas between economics and biology. Darwin's indebtedness to T. Malthus and the moral philosophers D. Hume and A. Smith is well documented. Conversely, many economists have been inspired by Darwinian (and Lamarckian) evolutionary theory. The group of economists who are influenced by evolutionary biology extends far beyond the economists who are discussed in this book.

The relationship between economics and biology goes deeper, I shall argue, than just some occasional transfers of ideas. The modes of explanation that are entertained in both disciplines show striking similarities. Only recently has it been observed by economists that their explanations

resemble the type of explanation that seems to be characteristic of biological theory: *functional* explanation. Crudely put, in functional explanation some (physiological or behavioural) trait is explained by the function that it serves, that is by the useful or beneficial unintended consequences that it has. As we will see, it is argued by Williamson, for example, that the explanations given in his transaction cost economics are of a functional type.

A related mode of explanation that is typical of both disciplines is *equilibrium* explanation. In equilibrium explanations, some specified dynamical process, in which the elementary units (of analysis) are involved, is shown to come to rest in a stable configuration at the systems (or aggregate) level. In evolutionary biological theory, the notion of a stable equilibrium is sometimes expressed by saying that 'fitness is equal at the margin'. It is *as if* individual organisms are maximizing their own fitness. In stable equilibrium, no individual organism could improve its fitness by changing its behaviour. Is this not close to what the visionary Marshall seemed to have in mind?

The foregoing preliminary remarks already indicate that I shall be engaged first and foremost in conceptual and philosophical analysis. The book is meant to be an enquiry into the foundations of new institutional economics. The contribution I want to make to the ongoing discussion in this field is primarily one of clarification. I am aware that this makes my approach vulnerable to obvious objections. The book will be inevitably incomplete, as it is practically impossible to incorporate all the literature that is relevant. And it runs the danger of being obsolete even before it is published. In a sense, I am trying to hit several 'moving targets'. There is 'work in progress' not only in the economic theories that are dealt with, but also in the philosophical discussion of the theories (see, for example, Mäki *et al.* 1993 and Hodgson 1993b). Nevertheless, I believe that I have identified some interesting and promising lines of economic research. Moreover, I am convinced that there is a need for careful philosophical analysis that has not yet been satisfied. I hope to have succeeded in developing a view on 'evolution' in economics that is both clear and comprehensive.

I shall not engage in a 'traditional' type of philosophical analysis in which preconceived philosophical standards (concerning 'genuine science' versus 'pseudo-science', or 'valid' versus 'invalid' explanation) are imposed on scientific theories. I shall rather try to make sense of (developments in) economic theories from an inside and historical point of view (see Diesing 1971). Economic theories will be viewed from the perspective of their 'originators'. What are the phenomena (or problems) that economists account for (or address) and what are the standards that they impose (either explicitly or implicitly) upon themselves? Thus stated, the point of view that I adopt may appear to be similar to the currently fashionable *rhetorical*

point of view. Rhetoricians like D. McCloskey and A. Klamer also opt for an inside and historical perspective (see McCloskey 1985 and Klamer 1983). The appearance of similarity may be reinforced by the fact that throughout the book I shall deal extensively with analogies and metaphors devised by economists. Indeed, the book is replete with thought-provoking analogies. It is precisely such 'figures of speech' that rhetoricians focus on.

My approach differs nonetheless from the rhetoricians' one in at least two respects. First, I shall not treat all analogies and metaphors on a par as 'strategic' rhetorical devices employed by economists to persuade other economists. Some analogies will be seen to serve illustrative or expository purposes only. Others will be shown to reflect basic background beliefs of economists about the mode of operation of generative mechanisms in economic processes.[4] In particular, I shall argue that the 'natural selection analogy' is of the latter type. Second, it will be examined whether analogies and metaphors are convincing by the economists' *own* standards. Some analogies will be judged to be misleading, others to entail tacit assumptions that are not explicitly argued for. Some analogies will be shown to be *non sequiturs* in arguments for which counterexamples can readily be provided. In short, unlike the rhetoricians I do not eschew any form of criticism. I shall not rest content with observing that analogies are persuasive to some subset of the scientific community of economists. The type of immanent criticism that will be espoused here is meant to delve deeper into 'what economists do'. I am convinced that genuine understanding of what is going on in economics can be obtained only if we are prepared to press hard questions upon economists, their theories and their arguments.

3. PLAN OF THE BOOK

The book is organized in three parts. The first part deals with firms and industries. All the arguments and theories that are discussed in this part turn out to bear a clear *family resemblance* to Marshall's evolutionary reinterpretation of marginal analysis. In Chapter 2, the 'selection arguments' of A. Alchian, M. Friedman and G. Becker will be discussed against the background of the 'marginalism controversy'. Alchian, Friedman and Becker will be seen to argue that industries behave *as if* they were populated by firms that are infallibly conducting marginalist calculations. 'Neoclassical' tendencies in industry behaviour are argued to be produced *really* by external selection forces impinging on individual firms.

Chapter 3 is about the 'new theory of the firm'. Whereas the old 'neoclassical' theory of the firm is concerned with industry (or market) behaviour, the new theory of the firm focuses on contractual relations within firms. The new theory of the firm will be seen to comprise several approaches, such as the property rights, the agency costs, and Williamson's transaction costs approach. Although these approaches differ from each

other in important respects, it will be argued that they all share the supposition that prevailing organization forms are efficient. Special attention will be paid to the 'general background' way in which the approaches are said to rely on the efficacy of market selection.

In Chapter 4, Nelson and Winter's evolutionary theory is subjected to a critical analysis. Nelson and Winter tend to present their theory as an antagonist to 'orthodox' neoclassical analysis. I shall emphasize the 'ancestral thread' that connects their theory via Alchian's selection argument back to Marshall's evolutionary speculations. Nelson and Winter's theory is treated as an attempt to model 'basic background beliefs' about market selection. The discussion will concentrate on Nelson and Winter's contention that firms are engaged in routine behaviour rather than in deliberate choice.

Part II deals with philosophical issues. In Chapter 5, types of explanation are analysed that are associated with evolutionary theorizing. Chapter 5 includes a digression into the notion of Darwinian natural selection in evolutionary biology. The discussion will focus on Elster's influential account of valid functional explanation in the social sciences. Functional explanation will be compared with other types of explanation, such as intentional explanation, causal explanation, Sober's notion of equilibrium explanation and Ullmann-Margalit's notion of invisible hand explanation. It will be examined whether the arguments, approaches and theories that are treated in Chapters 2 to 4 correspond to Elster's notion of 'full functionalism'.

Elster's crucial condition for a valid functional explanation is dealt with in Chapter 6: the demonstration of a causal *feedback* loop. It will be argued that of the theories considered, Nelson and Winter's theory is the only one that meets this condition. It will also be argued, however, that their theory entails the working of two feedback loops rather than one: economic 'natural selection' and adaptive learning. Their notion of adaptive learning is based on H.A. Simon's notions of procedural rationality and satisficing. I shall follow Simon in arguing that as adaptive learning resembles natural selection in relevant respects, it can also be called an evolutionary mechanism. Both evolutionary mechanisms are analysed in detail. Emphasis will be put on their dissimilarities and on problems with studying their combined, simultaneous operation.

In Part III the level of analysis is shifted to individuals and groups. In the theories that will be dealt with here, changes in group behaviour are accounted for in terms of evolutionary forces working on individual organisms. In Chapter 7, human beings are treated from a sociobiological perspective as organisms with inheritable behavioural dispositions. Several attempts by biologists are discussed to explain the natural selection of the socially optimal 'altruistic' behaviour. Maynard Smith's evolutionary game theory is used to demonstrate how *sub*optimal behavioural traits can be selected. Attention will be paid to 'group selection' and (Dawkins') 'gene

selection' that figure in the units of selection controversy in biology. Houthakker's comparison of the economic notion of division of labour with the biological notion of speciation is discussed to illustrate what happens when different levels of analysis are confused. Finally, I shall analyse the peculiar way in which economic analysis and sociobiological presuppositions are blended in Becker's, Hirshleifer's and Frank's accounts of altruism.

Chapter 8 is concerned with *cultural* evolution. The chapter starts with the 'Popper–Hayek connection'. It will be argued that appearances notwithstanding, Popper's view on trial and error learning, and the notion of blind search that is entailed in it, is compatible with Simon's notions of selective search. In Hayek's view, as we will see, the spontaneous cultural evolution of 'social order' is taken to be the unintended result of interacting, interdependent, learning and rule-following individuals. Hayek's claim that the rules that evolve spontaneously are optimal to the group as a whole will be attributed to his 'organicistic' notion of groups. I shall argue that game-theoretic notions and approaches capture essential elements of Hayek's view. I shall also argue, however, that game theory is suited to explicate why Hayek's claim is problematic in so-called cooperation games. The chapter will be completed with an examination of attempts by Ullmann-Margalit, Schotter, Axelrod and Sugden to show that Hayek's claim can be sustained also in cooperation games.

In Chapter 9 a realist Millian framework is developed to clarify the explanatory structure of the evolutionary arguments and approaches that are discussed in Chapters 2 to 8. The framework will turn out to be fruitful also for identifying differences between different strands in current evolutionary theorizing in economics and for formulating an agenda for further research.

Part I

FIRMS AND INDUSTRIES