

The Growth Spiral

Money, Energy, and Imagination
in the Dynamics of the Market Process



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Hans Christoph Binswanger

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Process

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Preface to the German Edition

The concept of “economic growth” became a slogan during the 1960s. It replaced the idea of “reconstruction,” which had guided economic activity since the end of the Second World War. The new slogan implied a return to the process of economic development of the nineteenth century which had been interrupted by two world wars and the Great Depression. However, before the 1960s “economic growth” had not been explicitly formulated as a concept, nor did the idea of the social product—today we talk of Gross Domestic Product (GDP)—represents statistically the annual product of goods. So far, it had never been imagined that GDP should continually increase from one year to the next by a constant percentage. This was quite new—even for an economist like myself who completed his studies at the end of the 1950s.

Until that time, the main object had been to find a way to prevent an interruption of the steady circulation of goods and money by the ups and downs of cyclical movements. But now it became a matter of extending the cyclical movements into a spiral, so that each cycle of economic activity would progressively augment production. At the time, I asked myself whether it was even possible for production to increase at a constant rate each and every year and hence exponentially. Was this not in contradiction with the first law of thermodynamics, according to which nothing in the physical world can increase, if not something else decreases? I looked for an answer in economic theory, which during the 1970s became increasingly concerned with the question of growth. But its findings left me unsatisfied, because increasing production was always attributed to “technical progress” in one form or another. But how could “technical progress” that comes from human knowledge result in quantitative economic growth? I could never get this question out of my mind, and it has remained there throughout all my years of research.

At the beginning of my academic career, I was preoccupied with policy-relevant questions. Over many years I studied issues related to European integration. I was particularly interested in studying the economic significance of a common currency as compared to multiple convertible currencies. This led me to pay greater attention to the interaction of real and monetary factors in the economic process, as shown

in my book “Markt und international Währungsordnung” (*The Market and the International Monetary Order*).

In due course, my interests shifted to questions relating to the natural environment. This led me into an intensive study of the natural foundations of economic activity, since it was obvious that the production of waste and emissions which are harmful to the environment was closely related to the input of energy and raw materials taken from natural resources and used in the economic process. This work has found its way into two publications: “Wege aus der Wohlfahrtsfalle” (*Ways out of the Welfare Trap*) with W. Geissberger, T. Ginsburg, and others, and “Arbeit ohne Umweltzerstörung” (*Employment Without Environmental Destruction*) with H. Frisch, H. Nutzinger, B. Schefold, G. Scherhorn, U. E. Simonis, B. Strümpel, and V. Teichert.

While working on these books, it became clear to me that both the money and the natural world played a much greater role in the economy than conventional economic theory has assumed. And so I formulated a new approach to understanding growth which, in my opinion, cannot be explained without including the contribution of monetary dynamics and of the role of natural resources in the modern economy. This led me to reconsider the general foundations of economic theory from the perspective of economic growth including money and natural resources. The result is presented in this book. It aims to provide some guidance to all those who have to make decisions concerning, in one way or another, future economic development, and who therefore have to deal with the opportunities as well as the risks of economic growth.

This book addresses both the economic specialist and the interested lay reader. It makes reference to various specific schools of thought and economic thinkers. It does not, however, assume any prior knowledge of these, since the main lines of argument and their conclusions are established without any specific recourse to such references.

My work on this book would not have been possible without the assistance of many people. First of all I would like to express my thanks to Guido Beltrani, who played a major role for the completion of this book. His dissertation “Monetäre Aspekte des Wirtschaftswachstums” (*Monetary Aspects of Economic Growth*) took up the elements of my thinking on the growth imperative that had been contained in preliminary studies for this book. His own findings have, in turn, found their way into this book. This is especially true for the chapter on “The Avoidance of Losses as the Growth Imperative” in Part III. Consequently, he is named there as co-author.

I wish to thank Joseph A. Weismahr for important references and suggestions relating to the theory of production and distribution from the perspective of an entrepreneur, and my colleague Erwin Staehelin for expert assistance in the presentation of company balance sheets.

Further special thanks are due to my colleagues Hans Nutzinger and Johannes Schmidt for their critical reading of the text and for valuable suggestions.

Important for the completion of the work on this book was the fact that I was allowed to continue working at the Institute for Economy and Environment of the University of St. Gallen, where I had worked before my retirement. For this, and for the attention given to my work, I owe special thanks to the Directors of the Institute,

my colleagues Thomas Dyllick and Ernst Mohr. I am also greatly indebted to the Institute's secretaries, Marlise Dreier and Vreny Knöpfler Mousa, for their untiring contributions in completing the manuscript and for never losing patience after many revisions. Christian Berger was of great practical help in designing the formal layout of the final version. I am very grateful to him for his work.

I am extremely grateful to my wife for the stamina she displayed in taking care of many things that I should have done, but did not do, while being busy with writing this book.

It was also a great pleasure that I was able to discuss this book with my sons, the economists Mathias and Johannes and the mathematician Klemens. Their knowledge of recent theoretical developments was a major contribution, and their open criticism has kept me from many errors. To them I dedicate this book.

St. Gallen (Switzerland), May 2006

Hans Christoph Binswanger

Preface to the English Edition

With modern economies becoming increasingly unstable, a critical evaluation of the conventional economic theory has become more and more crucial. Therefore, I decided to present an English version of my book “Die Wachstumsspirale,” which had first appeared in German in 2006. This book offers a new theoretical approach to understanding the modern economy, focusing on its dynamic aspects. This approach stands in contrast to the static equilibrium concept which has been the foundation of conventional economics. The English translation presents these ideas to a wider audience aiming to promote the renewal of economic theory.

The English version largely corresponds to the German version. However, the text has been shortened in various sections in order to focus on the main thrust of the book.

Many people have contributed to the translation. A first translation was made by Keith Tribe, David Andersen, and the staff of “Profi-Fachübersetzungen.” For further revisions of the translation I am grateful to Christian Berger, Hans Christoph Curtius, Philipp Friebe, Albert Gebhardt, Giulia Mennillo, and my sons Mathias, Klemens, and Johannes. For additional support, I am indebted to my colleagues Andreas Grüner, Fleming Ruud, and Erwin Staehelin and for many special advices to Josef A. Weissmahr.

I substantially benefitted from the opportunity to continue my work at the Institute for Economy and the Environment. In this respect I am obliged to my colleagues Thomas Dyllick and Rolf Wüstenhagen. Very special thanks go to Vreny Knöpfler-Mousa for the careful preparation of the manuscript and for always being ready to rewrite numerous versions of the manuscript.

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St. Gallen(Switzerland), Spring 2006

Hans Christoph Binswanger

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Growth! Growth of gross domestic product! That is a goal on which the world's nations all agree. This imperative is taken for granted, and no further explanation is needed. Everything else seems to follow from its achievement.

In the past it was not always assumed that economies grew and should grow. The first signs of growth can be found in ancient times. But the European economy experienced sustained growth for the first time in the era of discovery and conquest. This led to an enormous influx of gold and silver from America, which financed the growth of sea trade and created a global trading network. The actual takeoff started, on one side, with the invention of paper money in the seventeenth century and, on the other side, with the invention of the steam engine in the eighteenth century. Paper money and the later creation of money by banks, together with the steam and the electronic technology, created the conditions for the industrial revolution of the nineteenth and the twentieth century.

Of course, crises during the nineteenth century were still frequent, mostly brought about because paper money had still to be backed by gold. It was only after the two world wars of the twentieth century that the link was broken completely, enabling a constant and sustained period of growth in the second half of the century.

But soon the "Limits to Growth" became an issue. This was the title of a report published by the Club of Rome in 1972, signed by Donella Meadows, Dennis L. Meadows, Jorgen Randers, and William W. Behrens. This report warned of the catastrophic consequences that would result from continuous growth in a finite world. Specific limits were identified: the exhaustion of natural resources, environmental crisis resulting from the buildup of waste and emissions, and the finite nature of food supply relative to the size of a growing population. Discussion of these limits led to the principle of sustainability established at the 1992 Rio de Janeiro conference, which set a global standard for economic development. The central idea was, along with the guarantee of free and fair development opportunities for the Third World, the principle of moderation in the use of natural resources. The exploitation of natural resources should be regulated in such a way that it enables future generations to enjoy the same opportunities as those enjoyed by the present generation.

However, the limits to growth turned out to be less severe than the report of the Club of Rome originally had anticipated. This made it possible to focus the concept of sustainability on a limited number of issues: above all, on the deterioration of the climate as a result of the increase in the emissions of greenhouse gases. Subsequently, there has been little talk of general limits to growth. The postulate of sustainability became an additional goal instead of replacing the goal of growth. In case of any conflict between the two goals, growth always has had priority.

The increasingly powerful quest for economic growth contrasted with the inability of the conventional economic theory to adequately capture the phenomenon of growth. The reason for this is the fact that the core of today's conventional theory is based on the neoclassical model of general equilibrium, as developed by Léon Walras (1834–1910).¹ He treats the market as a series of barter between individual economic entities, which are, in principle, self-sufficient and exchange only their surpluses. In this model, the marginal utility of goods and the marginal productivity of the production factors decrease, if more goods are produced. The variations in relative or so-called real prices in the barter process under perfect competition, determined by supply and demand, always result in an equilibrium. This presupposes that all relevant resources are scarce and appropriated and that variations in the prices of resources facilitate the optimal use. This is referred to as optimal allocation. Both equilibrium and optimal allocation are inherently static. If achieved, there are no gains nor losses from changing economic activity any further. Hence, there is also no incentive for growth.

In reality, the social product has always continued to increase. To explain this continuous growth, conventional economics had to refer to “exogenous factors,” not included in the model itself. Initially, “technological progress” was used to square the circle between the growth of the social product and the static character of the model. “Technological progress” was introduced as a residual. It was simply assumed that this variable increased from year to year. Hence, economic growth was simply “explained” by introducing an assumption.

Since then, other factors have been proposed additional to “technological progress.” The most important among them are “learning by doing,” the increase in the stock of skills and knowledge through constant training and education, and the promotion of productivity by the formation of industrial “clusters,” among others. These factors can reinforce each other: Experience accumulates, improved education and training today improves future education and training, and the “clusters” interact and grow stronger. This is called “endogenous growth.” Of course, the inclusion of such factors made growth theory more substantial. But this “endogenization” remains

¹ The influence of Walras on conventional economic theory has been emphasized by Paul Samuelson, author of the most popular economics textbook (Samuelson and Nordhaus 1995). In his 1962 Presidential Address to the American Economic Association, he stated that “Most of the literary and mathematical economic theory appearing in our professional journals is more an offspring of Walras than anyone else” (Samuelson 1966, p. 1501). See also Wilfried Holleis (1985) for an account of the significance of Walras for conventional theory.

nevertheless incomplete, since the factors in question are also not integrated into the model of general equilibrium. With regard to the underlying model, they remain exogenous factors, just like “technological progress.”

Under such circumstances, it is no wonder that, having largely attributed the process of growth to exogenous factors, responsibility for its maintenance was also transferred to an exogenous institution: the state. It is the state’s task to provide more education and training, intensify competition, strengthen industrial clusters, and so on. But none of this is supported by any verifiable relationship between government activity and the market process. This is because the neoclassical theory has no room for the activity of the state.

Yet, economic growth, which represents an intrinsic part of the modern economy, cannot be explained by various constructs that are merely assumed and, as such, are nothing but stopgaps. Therefore, the underlying theory itself must be modernized. The factors and conditions characterizing the modern economy have to be integrated into the theory so that the growth tendency of the modern economy can be properly explained. This is not possible without taking account of the temporal dimension of the economic process—since growth takes time!—and so getting rid of the idea of a static equilibrium.²

The present investigation of the “growth spiral” is an attempt to build the foundations for a new theory of the modern economy. It is based upon the following premises, each of which takes account of time in a particular way:

The market is fundamentally different from barter between individual economic agents which are in principle self-sufficient. It is based on the interaction of firms (which specialize in production) and households (which specialize in consumption). Production in firms opened the way for the gradual development for the comprehensive division of labor that cannot develop in a barter economy.

Firms are artificial constructs that need capital in the form of money advances, with which they can purchase productive services from households *before* earning money from the sale of the products. To offset the risk associated with these advances, the firm expects a profit that equals or, if possible, exceeds the compensation of this risk.

Money is an integral part of the modern economy. The influence of money has been further increased by the creation of money in the banking system. Banks can advance credits to firms on the basis of money creation. The firms use them for investment and hence for the increase in production. Therefore, the increase of the quantity of money has a direct influence on the growth of the real social product.

Besides labor, today the most important factor of production is energy, which is constantly extracted from natural recourses.

Human imagination constantly invents or discovers new products which meet new wants. Therefore, imagination has become an important factor of production in itself, complementing labor and energy.

² See Elisabeth Allgoewer (1992) for a discussion of the necessity—and difficulty—of including time in economic theory.

The use of nature as a resource or a location for economic production, as well as a reservoir for waste and emissions, crowds out in many respects nature as living space. As a consequence, nature becomes more and more scarce. But since living space is not appropriated as such, and since consequently there is no price for it, this scarcity is not reflected in higher prices. Hence, economic growth continues without being impeded by the increasing scarcity of living space.

These principles broadly supersede the internal limits to growth implied by the modeling assumptions of neoclassical theory—the falling demand for goods due to their diminishing marginal utility and the decreasing marginal productivity of the production factors.

It follows from these principles that competition in the modern economy does not lead to a general equilibrium and an optimal allocation of scarce resources. Rather, competition brings about a constant tendency to transformation and growth. The economic process cannot be conceived as a circular flow in which the income that households receive from firms is equal to their expenses on goods purchased from firms. Household income instead grows with every circular flow because of the investment financed by newly created money together with an increasing stream of natural resources, including energy. In this way the circular flows, which formerly had prevailed, turned out into an *upward-moving spiral*. In each round the growth process creates more possibilities for growth, which in turn induces further growth. By contrast, where growth is insufficient, profits diminish, leading to a reverse spiral, which ends in losses and in a shrinking process. This results in a growth *imperative*.

Conventional economic reasoning still remains fully committed to neoclassical theory and has consequently become stuck in a dead-end street. There is only one way out of this dead end: Retreat back (at least) to the place where one has been *before* entering the dead-end street. In our case, this place is the classical theory.

The classical theory was primarily established by Adam Smith (1723–1790). A return to his ideas makes it possible to understand the market process in its temporal dimensions. But this does not mean that we should only go back to the classical theory. We need to go back also to the preclassical schools of thoughts, to the Mercantilists who emphasized the role of money, and to the Physiocrats who put more emphasis on the role played by nature. Nevertheless, we also need to move forward so that we can take into account the greater complexity of the modern economy. On the one hand, this means incorporating those elements of neoclassical theory that remain useful and valid—this involves mainly the derivation of demand from marginal utility—and, on the other hand, the findings of the historical school that developed in the nineteenth century and put the whole economy in a temporal context.

Important progress in economic thought was brought about by John Maynard Keynes (1884–1946), who showed that money does play a decisive role in the economic process. He overturned the neoclassical theory according to which money has no effect on real economic activity. However, his impact on economic theory faded in the last decade of the twentieth century, because his theorizing was too much focused on business cycles. As economic growth became the center of public