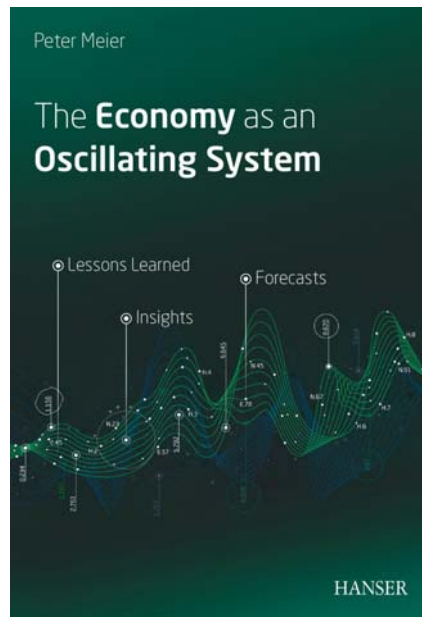


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Sample Pages

The Economy as an Oscillating System

Lessons Learned – Insights - Forecasts

Peter Meier

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Preface

As a sales manager and then CEO of Starrag for twelve years I experienced the impact of the business cycle first hand. This experience showed me that the business cycle is universally prevalent and affects all market players to a similar degree.

At an early point, I had intuitively developed the mathematical forecast model presented in this book, a model that transforms general economic indicators into industry- and company-typical patterns. Over the last twenty years I was able to devote myself almost exclusively to enhancing this model, and in the process I incorporated some of my experience during my time as CEO.

Swissmem took an interest in the forecasts for some of its specialist groups and provided me the opportunity to present my theories to a wider audience at its events. Eventually entrepreneurs approached me wanting to know if I could generate company-specific forecasts.

My research has now focused on how business cycle stimuli were propagated from the macroeconomic level of a national economy to the microeconomic level of a specific company. I gradually came to realise I had intuitively observed the course of economic events in the form of an oscillating system. The fact that some of the propagation mechanisms of business cycle stimuli are of a non-linear nature makes the course of economic events difficult to comprehend. But non-linearities also have the welcome side effect of generating time lags, which can be utilised for forecast purposes.

I am very grateful to the many companies in Germany and Switzerland with which I had such an in-depth and consistently invigorating level of contact. Without them, this book would not have been written.

I should especially like to thank Swissmem's "Machine Tools and Manufacturing Technology" specialist group as representative of the various specialist groups in the associations that regularly invited me to give presentations. During my time as CEO of Starrag I already had developed close links with this particular group. I am particularly delighted that the "Machine Tools and Manufacturing Technology" specialist group has facilitated and actively supported the publication of this book to mark the seventy-fifth year of its founding during its anniversary year.

The company hpo forecasting is now continuing my forecasting activities with verve and innovative ideas. I am very grateful to be able to place my life's work in younger hands.

A special thank-you goes to my dear wife Marguerite. She covered my back and helped me write this book by providing plenty of tips, critical suggestions as well as in many other respects.

Last but not least I should like to thank the staff at Hanser Verlag for the very pleasant collaborative working relationship. The editorial deadline meant that many diagrams reflect the status as at September 2018.

I have attempted to describe a number of economic relationships in terms of an oscillating system in the hope of contributing to a better understanding of economic processes and arousing readers' interest in continued research into this topic.

Peter Meier,
Goldach, March 2019

Introduction

The question of why crises occur has occupied my mind ever since I studied to become an engineer. Back then I wanted to know what triggered the major economic crises of the 1930s. I browsed a number of relevant books, but in the end was none the wiser.

My main occupation for around twenty years now has been observing, analysing and forecasting business cycles. Yet the question about what causes business cycle fluctuations is not an easy one to answer, even after poring over all the material. Economic researchers have been grappling with this topic for generations. The outcome of all their efforts is a large number of to some extent contradictory theories. Some are able to explain why certain economic slumps occurred in the past, while others are not able to do so. Some other theories are so scientifically abstract that barely any practical benefits can be derived from them. Things start getting really tough when evaluating future business cycle trends. There is only a tiny handful of approaches that could have predicted the financial crisis of 2008/09.

The intention of this book is not to provide an overview of all the business cycle theories out there. There are enough specialist books available that attempt to put the large number of theories into some kind of order; see for instance (Tichy, Konjunktur 1994) (Gabisch and Lorenz 1989). What seems to me to make more sense is to look at the commonalities between the various business cycle theories.

1. There is agreement that business cycle fluctuations stem mainly from fluctuations in investment activity.
 - Observing and analysing business cycles in the capital goods sector are most likely to deliver the approaches that explain the phenomenon of business cycle fluctuations. A wealth of experience from my everyday professional life led me to recognise this.
2. Most economists focus on business cycles in specific countries. What is generally involved here are the description and analysis of gross domestic product and its components.
 - From experience, I know that the capital goods industry went global many decades ago. I therefore cannot understand why so many economists stick rigidly to their national perspective. At most this can be explained by the fact that they de-

rive their income from each respective country. From my perspective I can say that business cycles in the capital goods sector need to be considered in a global context, or at least in the context of large regions (e.g. Europe, Asia, America).

3. The economy is viewed as a complex, non-linear system primarily in more recently propounded theories. We know from chaos theory that such systems tend intrinsically to fluctuate. External causes, such as wars or crises, are not required to trigger business cycle fluctuations.

→ The correlation between consumption and investment is already non-linear. What this means will be explained in more detail in Chapter 3. Added to that is the fact that in the course of economic events any one move in a particular direction is generally dependent on the preceding one. The prerequisites for a fluctuation-prone system are therefore met. Such systems exhibit typical behaviour patterns; in our case these are business cycle patterns.

The observations described in this book are based on these three points. The conclusions drawn may help to understand the mechanics of crises better and to identify impending crises in good time. However it is tough getting your bearings in a complex system. That works best by applying intuition. Nearly all the insights described in this book have accrued from my intuition. The prerequisite for that is an intensive examination of the material – plunging into the jungle of economic events, so to speak. I had multiple opportunities to do this during my many years as CEO of a medium-sized mechanical engineering company. Once you have that gut feeling, intuition gives you those insights in a flash.

I am no economist of any kind. Although I touched on these specialist subjects while studying to become a production engineer, I was not at home in them. Perhaps this not being burdened by expert knowledge benefited my sense of intuition. It was really able to run riot on the subject of business cycles, which is sandwiched somewhere between economics and business management. My flair for empiricism also stood me in very good stead.

I am now faced with the problem of committing the insights gained to paper in an intelligible way. That is not easy, by any means. Ultimately all economic events are inter-related. The standard scientific procedure, in which you break the whole thing down into its constituent parts and consider those constituent parts in isolation, is not really a suitable method of describing business cycles. Models, which capture these correlations in mathematical terms and are thus able to simulate economic events, are much more suitable. Although this helps to understand these correlations better, the obstacle to committing such models to paper in a generally intelligible way remains to be overcome.

The basic problem is that a complex system, in which everything is interrelated, can only be described to a limited extent in the one-dimensional form of a text. A description that tackles the problem from different angles, that effectively takes a helical approach, is possibly better suited. However it expects the reader to accept repetitions.

But that has other advantages: The reader can come on board at the point in which they are most interested.

The economy can be regarded as a living system. A living system organises itself and is reliant on an input of energy. This is the only way it can maintain its structure in a more or less stable balance. A living system is therefore in constant interaction with its environment and cannot be considered separately from that environment at all.

As far as any company, which is itself a living system, is concerned, its environment consists of its market, consumers, suppliers, competitors, the state and so forth. Its environment in turn consists of living systems, which are themselves surrounded by other living systems. Ultimately every company is embedded in the global economy and inextricably linked to it. That energy circulates within the global economic system in the form of intellectual or physical manpower, financial resources, raw materials as well as semi-finished and finished products.

However the question of which aspects of a complex system are the easiest to capture needs to be asked. In his work 'Metaphysics', Aristotle already distinguished between matter (structure, substance, quantity) and form (pattern, order, quality). He linked both through a development process. Fritjof Capra (Capra 2000) takes a very similar approach, by naming three fundamental aspects of complex (living) systems: **Pattern**, **Structure** and **Process**. Here he draws on works by neurobiologists Humberto Maturana and Francisco Varela, as well as by the Russian-Belgian physicist and Nobel Prize winner Ilya Prigogine. I would like to make use of these organising principles in the rest of this book and apply them to the subject of crises and business cycles.

The analysis encompasses three points:

- The pattern communicates the history of the system: its actions and afflictions. Here the focus is on its afflictions. In terms of economic events, these are crises. What's involved here are the major crises and the question of what impact global crises have on subsystems, i. e. an industry or a company.
- The structure of a living system always depends on its environment as well. It therefore cannot be described in general terms. Yet all living systems have at least one commonality: they put considerable effort into maintaining their structure. In economic event terms this means that once a growth trajectory has been embarked upon, it will be adhered to for as long as possible. The transition to another growth trajectory involves a more or less major crisis.
- Process involves the question of how a stimulus is transferred from one subsystem to another. For example, along the procurement chain or from the market to suppliers.

The conclusions of the analysis are:

- Economic events are subject to a pulse rate. In a way that makes them predictable.
- The majority of crises are foreseeable.

Ultimately this book is presenting a forecasting system that enables demand for capital goods to be forecast pretty reliably up to eighteen months into the future, based on global economic indicators. The approximate timing of an impending global economic crisis can also be gauged by more than a year in advance, based on hypothetical assumptions that can be periodically reassessed.

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