Inventories in National Economies

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A Cross-Country Analysis of Macroeconomic Data

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Preface

Are they really important? Inventory investments are just a tiny part of GDP spending: in developed economies, their share fluctuates around 1%, which is hardly observable among the much higher figures of private and government consumption, fixed assets investment and foreign trade.

Nevertheless, economists do not look at just the magnitude: they generally consider those factors very important in the economy which signal changes, and inventories are among the fastest and most flexible indicators of shifts in economic processes. Indeed, there is a rich literature analysing the regularities of inventory fluctuations, most of all the role of inventories in economic cycles. This literature includes a number of results on comparison of cycles in different countries, digging deep in order to find both the theoretical explanations of the general characteristics of cyclic behaviour and the specialties which drive the behaviour of individual countries.

Subject

The authors of this book approach the macrolevel inventory problem from a different point of view. Our earlier research revealed that one can find interesting things when looking—instead of short- or middle-term fluctuation—at the long-term formation of national-level inventories. In the framework of the project leading to this book, we wanted to discover: are there general rules of national inventory investments, and can we find characteristic factors leading to higher—or, in other cases—lower level of inventories in the different countries? Are there identifiable global trends or inventory formation depends only on national economic or even also non-economic processes? Do macroeconomic features (like stability or growth) play the key role, or sectoral characteristics are more important? What is the influence of general business trends, most notably firm-level inventory management? Can we identify groups of countries with similar inventory behaviour and what are common characteristics of those countries, which belong to the same "inventory cluster"?

After overviewing several theoretical and practical aspects, we have chosen to limit our study to the well-identifiable group of most developed countries: members of the Organization for Economic Cooperation and Development (OECD). Besides the very reasonable aspects of data availability and quality, we thought that we can get closer to our objective: concentrating on the characteristics of national inventory investment if we do not have to screen for large differences in the level of development. Of course, OECD economies are not alike either—however, in many aspects (like in the quality of institutions or the development of infrastructure), they are relatively close or at least comparable with each other.

A very serious problem we had to overcome is the quality of the available data. It is quite clear that in any cross-country comparison there can be doubts about the validity of the data sets serving as foundation of the analysis. As for inventories, the queries can be even more legitimate than in some other cases, considering the country-wise differences in inventory accounting. We are aware of these differences. However, we hoped to overcome this problem by using long time series on the one hand, and relative, instead of absolute indicators on the other hand. However, we are rather cautious in drawing conclusions in order to avoid mistakes of false statements.

Structure

The structure of this book is the following: after a short introduction (Chap. 1) explaining the importance of inventory holding in the economy, we give an extended review of the literature (Chap. 2). Even though there are rather few sources which we could use directly in our analysis, we considered it important to show how many different aspects of macroeconomic inventories were researched in the last few decades. As a general conclusion, we can state that there are mostly isolated results, and one can hardly find any systematic analyses of inventories in the literature.

In Chap. 3, we put down the principles of country and data selection and some fundamentals of the methodology. Chapter 4 provides the core statistical analysis of our research. We compare inventory behaviour and its influencing factors in the 20 OECD economies for which we had data for the full 1970–2013 time period, and then, we test the results' stability by adding to the analysis 12 more countries for which we had data only for a shorter period, namely between 1994 and 2013. For the 20 "core countries", cluster analysis and stability test are carried out, and then, the sectorial structure and cyclic behaviour of inventory investments are analysed.

Chapter 5 contains an analysis of those macroeconomic phenomena which we use for explanation of inventory behaviour to see how stable is the background of the analysis. In Chap. 6, we give a detailed description of inventory behaviour in the individual countries. This part connects national inventory holding to global economic processes and country-wise economic policies. Chapters 4 and 6 are the pillars of our research results. Chapter 7 summarizes the results of this book and provides general conclusions.

We see our analysis as kind of a groundbreaking work in a branch of macroeconomic inventory analysis. We certainly hope that some colleagues worldwide will find the approach and the results appealing enough to go on with studying the many open questions of the field.

Focuses and Takeaway

Our extensive review of the literature clearly reveals that there are very important and interesting results in the field of macroeconomic inventory problems. However, when one tries to integrate these results, he/she will find that they are very diverse in their many important starting assumptions as well as in their conclusions. It is hard to classify the hypotheses and the models, and it is even harder to summarize the results.

Our book does not attempt to be a fully comprehensive analysis of the many open macroeconomic inventory issues. However, we believe that some of the results help to evaluate important empirical phenomena (such as through the comparison of inventory behaviour in different countries or finding links between macro- and microeconomic factors). It may help forecasting inventory investment in various countries and prepares the ground for further research.

One of the unique features of our work is that unlike the vast majority of literature we focus on long-term (over four decades) developments and explain the long-term characteristics of national inventory behaviour. Both economic considerations and the availability of data led us to examine inventory investment characteristics of various countries through observing what proportion of the annual GDP is invested into inventories. The long time series of inventory investment actually show us the level of inventories with which a country operates, since clearly the current inventory level is the sum of inventory investments of past years.

The importance of our analysis is underlined by the fact that the inclusion of inventories into some macroeconomic models in many cases substantially changes the results obtained in the "inventory-free" model. This is a clear indication of the presence of some inventory-related factors in the causality chain. We disclose some of such factors and call attention to their impact on the course of events. Having read the book, one should be convinced about the fruitfulness of including inventories in macroeconomic studies.

It was more than twenty years ago when the International Society for Inventory Research (ISIR) organized a two-day workshop on the relationship between macro- and microeconomic inventory research with the participation of many of the most influential inventory scholars of the time. The workshop was inspired by two seminal papers (Blinder-Maccini 1991 and Lovell 1994, see references at the end of the literature review) and drew the conclusion that there are two main reasons for the existence of the macro–micro gap: (i) the fundamentally different paradigm behind the two research fields and (ii) the lack of micro-based research of macroeconomic phenomena. Our book provides several important and historically supported clues for the importance of the micro–macro analysis and hopefully puts down some fundamentals for this line of research.

We extend our work also to the opposite direction: while most of the literature focuses solely on country developments, we put an emphasis also on those global effects which influence several or all countries in our sample. We deal with inventory-related consequences of the oil crises, the manufacturing revolution, the process of globalization or the great moderation as well as the transition of Central-Eastern European countries from planned to market economies.

Clustering the countries in time and space according to their inventory behaviour and the changes of the clusters shed light on "inventory connections" between different countries and on the impact of different historical events (such as common characteristics of countries in the same "inventory cluster" and the explanation for changing cluster structures).

A very important result of our research is the presentation of the change of inventory behaviour in the process of transition from planned to market economies. The fundamental difference of inventory behaviour in the alternative systems has been well documented for a long time—our research not only exposed how fast inventories in the new market economies have been adjusted but explicitly shows that they are following the same pattern as traditional market economies, at a lower level of efficiency. This is (i) an important contribution to understanding the basic differences between the two systems and (ii) an important verification of our findings about the general nature of macroeconomic inventories.

As we describe it in the introduction, volatility is an intrinsic characteristic of inventories. So even though we focused mainly on the stable characteristics of inventories, we had to deal with the fluctuations as well. We exposed several regularities of inventory formation over time and over countries, some of these are related to global developments some others to country characteristics. Understanding the differences between these two types of effects is very important for a correct analysis of situation in any countries. Having studied the rich inventory cycle literature, we found it useful to apply a methodology still unused in this area which connects our macroeconomic approach to traditional inventory cycle research and confirms the usefulness of studying the connection between inventory investments and other macroeconomic variables.

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