



Inventory investment and GDP characteristics in OECD countries

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ABSTRACT

There are very few research studies on macroeconomic inventory behaviour of various countries. It is clear that macro inventories are the results of a large number of individual microdecisions. However, we believe that it is worth analysing how inventories develop in the individual countries and why we can see different tendencies.

This paper is the newest piece in a series of studies on the above subject. We use the OECD database to analyse inventory trends between 1987 and 2004 in nine of the most developed economies of the world. Annual inventory investment data are used and their connections with other components of GDP expenditure (governmental and private consumption, investment in fixed assets and foreign trade balance as well as the annual growth rate of GDP) are examined by multi-variable statistical analysis. Conclusions include the steadily decreasing tendency of inventory fluctuations, the varying periods of higher and lower rates of inventory investments and the differences of main influencing factors by country.

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1. Introduction

This paper is a continuation of a series of studies that are aimed to disclose connections between inventory investment and other macroeconomic indicators, as well as to explain their tendencies and countrywise differences. We believe that it makes sense to ask: what are the driving forces and consequences of different inventory behaviour of various economies?

Some interesting conclusions could already be drawn (for a summary of previous results and consequences, see Chikán and Tátrai, 2003; Chikán et al., 2005).

For the current study, we have again used the OECD database (www.oecd.org) and applied SPSS (1994). We have found all necessary data from 10 countries:

Belgium
 Canada
 Finland

France
 Italy
 Japan
 The Netherlands
 Sweden
 United Kingdom
 United States

This list of countries is shorter than in our previous study—the database does not contain appropriate inventory data from Denmark, Germany, Ireland and Spain. Also, Italy has been left out since there were unexplainably high inventory investment data in the database, which could not be considered other than some statistical mistake. Just like in previous studies, we have used annual data because of lack of a more detailed database. Again, we emphasize that since our objective is to discuss long-term characteristics, annual data are sufficient.

It is also our obligation to call attention to the uncertainty involved in any macroeconomic data analysis—because of that we must be very careful in the interpretation of results.

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It should also be added that our results published in Chikán et al. (2005) cannot be directly compared with those in this paper since in the previous study OECD data were given in 1990 USD, while in the meantime data came out in 2000 USD. We believe that even though a direct comparison would have been interesting, our main results are not influenced by that change.

In Chikán et al. (2005) we used USD 1990 data from 1968 to 1997 (30 years) divided into two subperiods: 1968–1983 and 1984–1997. Now we have a homogeneous data set of USD 2000 data between 1987 and 2004 (18 years). The 11-year overlap between the two data sets establishes a sound connection between the two time series.

2. Research hypotheses

Our hypotheses are mainly coming from our previous studies:

H(1). The basic trend of investing a decreasing proportion of GDP to inventories continues in the developed countries.

H(2). Inventory behaviour of the most developed economies is becoming more and more similar, which means that long-term averages of annual inventory investment in % of GDP of various countries are getting closer to each other. (We shall denote the inventory investment/GDP ratio as STOCK—this is the proportion of GDP invested in inventories in a given year. STOCK, of course, can have a negative value; inventories decrease.)

H(3). Higher growth rate of the GDP goes together with higher STOCK and with its larger fluctuation.

H(4). STOCK is positively correlated with gross fixed capital investment.

H(5). STOCK is negatively correlated with annual foreign trade balance.

H(6). No general regression model can be applied to various countries to express relations of STOCK with other components of GDP.

H(1) is a long-term tendency, which has been first examined in the late 1980s (Chikán et al., 1996). At that time we still could not show a decreasing trend—even though it was well known that there had been for that time already important inventory-reducing managerial changes introduced at the factory level (MRP, MRP II, JIT, etc.). However, we could not see convincing changes in the inventory investment ratio of various countries. It seemed that there are other influencing factors, like the more complex character of economic activities, which—even if all economic agents have individually reduced inventory—could lead to a generally higher nationwide inventory. Now it seems (as it is expressed in H(2)) that there are two trends: globalization and (international) supply chain management, which together led to lower general inventory investment and in the same time more unified inventory behaviour.

H(3) is a relatively straightforward economic statement: even if inventories are really small, they need some room for manoeuvring; therefore, they fluctuate more (not in absolute figures, but relative to their average).

H(4) and H(5) are the results obtained in previous studies. It is logical that if higher growth of the GDP goes together with higher investment in inventories then investment in fixed assets is also higher in these periods. As for foreign trade balance, in previous studies we found a significant correlation of it with inventory investment—as if they were alternative short-term adjustment parameters.

H(6) expresses the experience that even though there are important similarities among the developed countries we still cannot explain their inventory behaviour by using a unified model containing the same variables.

We have used various statistical methods to analyse the above hypotheses. We shall refer to the methodology at each section separately, because we usually applied different methods to test the individual hypotheses.

3. Timewise tendencies of inventory investment

As for the annual inventory investment ratio (STOCK) we have found that—to the extent the change in currency base let us make such a comparison—its average over the last 18 years (see Table 1) was (i) definitely lower in case

Table 1
Long-term average of annual inventory investment/GDP ratio and its variation

Countries	Average RSI		Standard deviation		Coefficient of variation	
	1968–1997	1987–2004	1968–1997	1987–2004	1968–1997	1987–2004
Canada	0.0051	0.0018	0.0091	0.0062	1.80	3.54
Finland	0.0064	0.0023	0.0161	0.0086	2.51	3.75
France	0.0071	0.0024	0.0102	0.0049	1.44	2.05
Japan	0.0092	0.0030	0.0100	0.0046	1.09	1.52
Sweden	0.0016	0.0031	0.0128	0.0050	8.03	1.62
UK	0.0034	0.0033	0.0128	0.0040	2.32	1.24
US	0.0059	0.0037	0.0053	0.0030	0.90	0.81
Belgium	0.0038	0.0041	0.0072	0.0051	1.88	1.24
The Netherlands	0.0060	0.0046	0.0076	0.0054	1.27	1.16
Total	0.0053	0.0031				

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