

The estimation of changes in stocks in manufacturing, wholesaling and retailing

It is well known that changes in investment in stocks of goods and work in progress can be an important influence on the demand for resources, whether domestic or imported, because of the big variations in the rate of stockbuilding that can occur from one period to another. As very large stocks are held by the economy, proportionately small changes in the aggregate of stocks can bring about sharp and significant movements in the rate of investment. In 1950, for example, total stocks fell by £190 million and in 1951 rose by £400 million—a change in demand on account of stockbuilding of £590 million⁽¹⁾ (which represented three-quarters of the increase in demand from all sources). Whilst these are perhaps exceptional variations, changes from year to year have frequently been considerable.

2. At the end of 1957 the total value of stocks (including work in progress) held in the United Kingdom economy was nearly £9,000 million. By industry of ownership this total was divided as follows:—

Industry	Stocks held ⁽²⁾		Percentage of total
	£ million		
Manufacturing	4,622		53
Retail trading	853		10
Wholesaling ⁽³⁾	1,000		11
Agriculture and Forestry	955		11
Mining and quarrying ..	142		2
All other	1,184		14
Total	8,756		100

Manufacturing industry, wholesaling and retailing thus account for about three quarters of the total stocks held.

3. The estimation of the level of stocks in these three industry groups and of current changes in them is based upon various inquiries conducted by the Board of Trade. Some of these inquiries have been newly developed or are still in the course of development as part of the Government's plan for improving our statistical information announced by Mr. Macmillan—then Chancellor of the Exchequer—in the House of Commons in August, 1956.

4. This article confines itself to describing how the basic material on stocks held by manufacturers, wholesalers and retailers is collected and used to produce estimates either of the level of stocks or changes in stocks at the valuations placed upon them by the stock holders. Further work has to be done in order to fit the information into the framework of the National Income Accounts; for example the elimination of stock appreciation.

Manufacturing Industry

5. The distribution of stock holding in manufacturing industry at the end of 1957 is set out below.

Standard Industrial Classification Order	Industry Group	Stocks £ million
III	Food, drink and tobacco	623
IV	Chemicals and allied industries	365
V	Metal manufacture	413
VI-IX	Engineering and allied industries	2,127
X-XII	Textiles, leather and clothing	629
XIII-XVI	All other manufacturing industries	465
III-XVI	All manufacturing industry	<u>4,622</u>

Reflecting the industrial pattern of the country there is a heavy concentration of stocks in the metal manufacturing and engineering industries, which hold about 55 per cent. of all stocks in manufacturing industry.

6. Of the total of £4,622 million, £2,021 million was regarded by the stock holders as materials and fuel, £1,558 million as work in progress and £1,044 million as finished goods. As in all the Board of Trade inquiries into stocks, this analysis reflects an economic rather than a commodity classification. Goods are classified according to their status in the business of the stock holder, so that the same kind of items reported as finished goods by one establishment may be reported as materials by another, and the aggregate figure for both headings (as indeed for work in progress) contains a high proportion of intermediate products. The purpose which this analysis is designed to serve is to help to elucidate the meaning and causation of stock movements which, of course, have to be interpreted in the knowledge of the economic circumstances prevailing.

Annual figures

7. The basic source of information about manufacturing industry's stocks is the annual census of production which every three or four years has included all but the smallest firms and in the intervening years has been on a sample basis which, however, covers about 70 per cent. of the employment or output of the industries included in the inquiry. The estimates obtained from the censuses of the levels of stocks and of the changes in each year may consequently be assumed to be of a high order of reliability.

8. Summary results of the censuses containing estimates of the change in the value of stocks are available by the end of the year following that to which a census relates. For example, the provisional results of the census for the year 1957 were published in the *Board of Trade Journal* of 21st November, 1958.

⁽¹⁾ These figures are at 1948 prices from Table 13 of *National Income and Expenditure*, 1958.

⁽²⁾ These figures are based on later information than that used for *National Income and Expenditure*, 1958.

⁽³⁾ For reasons which are explained in this article the estimate of stocks held by the wholesale trades is a very round one.

Quarterly figures

9. In order to obtain current information about changes in manufacturers' stocks, the Board of Trade ask a number of companies to report the value of their stocks and work in progress on a voluntary basis each quarter. The companies approached were not chosen by probability sampling, but were selected from those which, from figures available from the censuses of production, were among those carrying large stocks. It was thought likely that these would be able to provide quarterly estimates. With the co-operation of industry the sample of reporting companies has been considerably strengthened since the inquiry began. Contributing companies now number about 500 and account for about half of manufacturers' stocks. Further strengthening of the panel of reporting companies is in process.

10. The reporting unit in the quarterly inquiry is the business as a whole. Parent or holding companies are asked to provide information on their own stocks and those of their subsidiary companies. The larger companies with diverse activities carried on as separate businesses are asked to report separately for each of the broad industry groups in which they operate, some of which, e.g. retailing, will be outside the field of manufacturing. Returns for individual businesses are classified to the appropriate industry group. As the reporting unit is the business and not an industrial factory or establishment, it is not thought to be rewarding to attempt to work to the fine industrial classification appropriate to a full census of production.

11. Companies are asked to state the total value of their stocks at the beginning and end of each quarter, giving, if possible, separate figures for each of the three categories mentioned above. They are asked to adopt whatever accounting practice they normally use, and to give figures for the two dates on the same basis.

12. Publication of quarterly estimates of changes in manufacturing industry's stocks started at the beginning of 1956. Provisional estimates of changes in the total value of stocks are published in the *Board of Trade Journal* about two months after the end of each quarter, and final estimates are published about a month later. (See, for example, the *Board of Trade Journal* of 5th December, 1958 and that of 16th January, 1959.) In these final estimates, the value of the change during each quarter and the percentage change between the beginning and end of each quarter is shown for total stocks analysed into the three categories mentioned in paragraph 6 above and separately for four broad industry groups⁽¹⁾. The strengthening of the sample may permit somewhat greater industrial detail to be shown in the future.

13. As the census of production is virtually comprehensive in some years, and in others covers a larger and more representative sample than does the quarterly inquiry, it provides the more accurate estimates of annual changes. For this reason, the quarterly estimates for a given year obtained by the inquiry are adjusted when census figures

for the year are available to be consistent with the annual changes for manufacturing industry shown by the census. Published figures for the latest complete year and succeeding quarters are based only on the experience of companies contributing to the quarterly inquiry, but figures for earlier years have been adjusted to reflect the results of the censuses.

14. In the past, the annual changes shown by the quarterly inquiry have been slightly higher than those shown by the censuses. The comparison for total stocks in the years 1955-57 is as follows:—

Percentage changes in total value of manufacturers' stocks between beginning and end of year

	1955	1956	1957
Census results	11	9	6
Quarterly inquiry	13	10	8

15. While the percentage changes from the two sources are reasonably close it has to be remembered that, since the total value of manufacturers' stocks is upwards of £4,000 million, the difference between the two percentages is, in absolute terms, considerable in relation to the changes in the total demand on resources between one year and another.

16. There are a number of reasons why these series should differ. In the past the census figures for manufacturing industry have in general been confined to manufacturing establishments and have excluded stocks of merchanted goods held by manufacturers and stocks of manufacturers' separate wholesale or export organisations while the quarterly series has obtained statistics of all stocks held by a sample of businesses mainly engaged in manufacturing industry. Estimates based on the quarterly returns have related to calendar years, while census figures are compiled from returns which in many cases relate to the financial years of businesses which do not coincide with the calendar year. The quarterly inquiry is not fully representative of manufacturing businesses of all sizes and the experience of large businesses is necessarily over-weighted. From 1959 the sample censuses will, like the quarterly inquiry, cover the total stocks of businesses engaged in manufacturing: this will at once bring the two inquiries on to a common system and provide a firmer basis for extrapolation using the quarterly statistics. In addition the annual figures will relate more closely than formerly to the calendar year.

17. One result of the adoption of the business rather than the establishment as the unit of reporting and of classification for the sample censuses of production will be to move the line of demarcation between manufacturing and wholesaling in a direction that will increase the stocks at present classified as held by manufacturing industry and reduce those at present classified as held by wholesaling (for example in the table in paragraph 2 above). The essential reason for the change is that when the unit of classification is the business as a whole, ancillary activities

⁽¹⁾ Food, drink and tobacco; metal manufacture, engineering and allied industries; textiles, leather and clothing; all other manufacturing industries.

such as a separate sales organisation will, with their stocks, be covered as part of the main activity and not classified separately to wholesaling or merchanting. It is estimated that on this basis wholesaling stocks in 1957 would be substantially less than the £1,000 million at which they have been broadly estimated on "establishment basis". Another result of this change is to bring within the scope of the census statistics, stocks which are not held at United Kingdom business establishments, e.g. stocks abroad or afloat.

Wholesalers' stocks

Annual figures

18. In this context the wholesale trades are taken as comprising Minimum List Headings 810, 831 and 832 in the revised Standard Industrial Classification. They include, therefore, in addition to what might be termed wholesale distribution proper (Minimum List Heading 810), dealing (wholesale or retail) in coal, builders' materials, grain and agricultural supplies (Minimum List Heading 831), and dealing in other industrial materials, such as timber and metals, and machinery (Minimum List Heading 832).

19. There has been no census of the wholesale trades based upon returns for individual establishments since the census of distribution and other services for the year 1950. That census, which was complementary to a full census of production taken on an establishment basis, brought within the wholesale trades all establishments and departments concerned with wholesaling even when ancillary to another main business.

20. Since 1950 there have been considerable changes in trading conditions; for example, a large decrease in the stocks held by Government departments as trading bodies and correspondingly an increase in the stocks of import merchants. Our information on the changes in stocks since 1950 has been fragmentary except in recent years following the beginning of the quarterly inquiry—referred to below—and we have no systematic basis for making a satisfactory estimate of the current level of wholesalers' stocks. The best estimate that can be made is that the present level of stocks is around £1,000 million.

21. In order to develop a comprehensive and timely reporting of stocks, it has been decided, as explained above, to move away in the annual censuses of production (except for the periodical detailed censuses) from the reporting of stocks on an establishment basis to a reporting on the basis of the business, company or group. This system of reporting has also been adopted for the annual sample inquiries into the distributive and service trades, which, *inter alia*, cover the wholesale trades.

22. These annual inquiries—taken on a sample basis—have been described in the *Board of Trade Journal* of 6th February, 1959. Because a register of companies could be made available speedily and economically whereas one covering unincorporated businesses could not, the coverage of wholesalers in these inquiries has been of companies

only which, however, are estimated to account for upward of 80 per cent. of stocks carried by this category of business. These figures can be used with other information to build a fairly reliable estimate of the total stocks of wholesale businesses, and they provide a good indicator of annual changes in wholesale stocks. Methods are now being considered whereby information could be obtained from a sample of unincorporated businesses.

23. The results of the annual inquiry showed that companies engaged in the wholesaling trades held about £600 million of stocks at the end of 1957. Allowing for unincorporated businesses not covered by the inquiry and for the stocks of merchant converters (who make returns in the census of production), therefore, about £800 million was so held. The difference between this figure and the approximate figure of £1,000 million makes a very nominal allowance for the stocks of merchant goods held by manufacturers and for the stocks of manufacturers' selling organisations, neither of these stocks being included in the estimates of manufacturers' stocks made from the censuses of production.

Quarterly figures

24. A new quarterly series on changes in the value of stocks held by the wholesale trades was introduced this year (see *Board of Trade Journal* of 16th January, 1959). The series is partly derived from a voluntary quarterly inquiry, begun in 1957, covering at present about 400 wholesalers, and partly from statistics already available on stocks of specific commodities, (e.g. metals, timber and textiles held by merchants). The voluntary contributors do not represent a systematic sample of the wholesale trades covered; in general only the larger stockholders make monthly or quarterly stock valuations, and the panel of contributors is drawn almost exclusively from these.

25. The provisional figures become available about two months after the period to which they relate and provide a relatively up-to-date indication of how stocks are changing. A more precise estimate of the extent of the change over the year is derived from the annual inquiry. The following figures illustrate the extent of the revisions made for 1956 and 1957 as a result of the fuller annual inquiries. The quarterly inquiry indicated a rise of 0.9 per cent. in total wholesale stocks between the beginning and the end of 1956, whereas the annual inquiry showed a rise of 3.0 per cent. In 1957 the results were closer; the quarterly inquiry showed a rise of 7.4 per cent. and the annual inquiry a rise of 7.2 per cent.

26. The figures published for the broad groups of trades will, in general, be less reliable than the figures for total stocks because they are based on smaller samples, but they afford useful indicators of where the principal changes are occurring. For the present, the new series shows only changes in the total stocks of the wholesale trades together with figures for Minimum List Headings 810 and 832 separately. But an expansion of the quarterly inquiry is now under way which should make it possible for more detailed information to be shown.

Retailers' stocks

27. Total stocks held by retailers are estimated to have been about £850 million at the end of 1957, approximately divided among the different kinds of retailer as follows:—

	<i>Percentage of total</i>
All shops	100
Food shops	22
Clothing and footwear shops	29
Durable goods shops	18
General department stores	5
Miscellaneous non-food shops	26

Independent retailers held about 60 per cent., multiple retailers a little over a quarter, and co-operative societies about 9 per cent. of the total stocks.

28. The estimation of changes in retailers' stocks makes use of a three tier structure of statistical inquiries. In the first place, the census of distribution, taken at intervals of several years, provides a good measure of total retail stocks; secondly, the inquiry into the distributive and service trades collects information once a year (except, of course, when a census of distribution is being taken) from a substantial sample of larger retail businesses; and thirdly, information is collected monthly from retailers who are able to provide a monthly figure of stocks, and this limited information is used, in conjunction with the results of the other two inquiries, to compile estimates of the monthly movements.

29. The census of distribution for the year 1950 covered virtually all retailers' establishments. It provided a substantially complete count of retail stocks (at the beginning and the end of the year) and also the detailed base year information (for example, an analysis by kind of business and form of organisation and also stocks/sales ratios) which is necessary to combine appropriately the sample information collected in the inquiries taken between censuses. A second census was taken in respect of 1957. There was a complete coverage of multiple shops, department stores and the larger independent shops and co-operative societies together with returns from a sample of the other independent traders and co-operative societies. Results are currently being compiled.

30. It is very necessary to collect annual information on stocks in order to reinforce the somewhat slender information which is all it has yet been possible to collect from retailers monthly. Virtually all businesses have information on stocks once a year, and it is this information which the inquiry into the distributive and service trades is designed to collect. (Retailing was covered in the annual inquiries for 1956 and 1958.)

Monthly statistics

31. As already indicated, the sample of retailers reporting monthly information on stocks is necessarily rather limited, since many businesses do not maintain monthly records of stocks. The estimates for the changes in retail stocks each month cannot be expected, therefore, to have a high

degree of accuracy. It is believed that the figures are sufficiently reliable, however, to reflect significant movements.

32. The sample consists of a number of multiple retailers, a substantial proportion of department stores and some large independent drapers and furniture shops. In addition, the Co-operative Union collects stocks information each month from a sample of co-operative societies and makes this available in summary form to the Board. The proportion of total stocks accounted for by these types of retailer is rather less than half, while the sample actually reporting covers about 30 per cent. of the stocks held by these retailers, or about 15 per cent. of total stocks.

33. This restricted information, which includes very little relating to independent retailers, is used to compile estimates of changes in total retail stocks by giving to the independent retailers not represented in the sample an appropriate weight, kind of business by kind of business, and assuming for them the same stocks movements as for the sample. Incorporated in the compilation are estimates of the level of stocks at the beginning and end of 1956 mainly derived from the inquiry into the distributive and service trades for 1956 and information from the census of distribution for 1950 was also used. The results of the census of distribution for 1957 may show that the series needs to be revised.

34. Only a series for total retail stocks is published. Whilst separate estimates are made for each kind of business in the process of compiling the figure for total stocks, neither these estimates for individual kinds of business, nor those for broad sectors of trade, are considered sufficiently reliable for publication.

Future action

35. Much of the improvement in our information on the stocks held by manufacturers, wholesalers, and retailers, has taken place in the last few years. In particular the quarterly series on manufacturers' stocks which was established in 1954 has been much strengthened; the quarterly series on wholesalers' stocks was introduced earlier this year; and some monthly information on retailers' stocks is now being published. All this means that our knowledge of the recent movements of a large part of the total stocks held in the economy is now much better and more systematic than it was a very few years ago.

36. There are, however, three main deficiencies in our present information on stocks, for two of which remedies are in sight.

37. A most intractable problem affecting the reliability of our information on short-term changes in stocks is the representativeness of the sample of firms contributing monthly or quarterly figures. The sample of manufacturers is on the whole satisfactory and only minor improvements are probably needed; the sample of wholesalers is rather small and attempts are now being made to improve it; and the sample of retailers is small and through being

confined to the largest retailers, probably biased. The difficulty of recruiting wider and more representative samples of contributors is of course that many firms, especially the smaller ones, do not make quarterly or more frequent estimates of the value of their stocks. This is especially a problem in the retail sector where small firms are numerous and account for an important part of the total. These facts make a solution hard to find.

38. Secondly, there is no very secure basis for an estimate of the total stocks held by wholesalers' businesses. The best estimate of the total stocks of wholesalers is based upon the figures collected in the inquiry into the distributive and service trades for the year 1957, and since this inquiry is on a sample basis and confined to incorporated companies

the estimation of total stocks (including stocks held by unincorporated businesses) is not as reliable as it should be. To remedy this deficiency more comprehensive figures are needed.

39. There have been deficiencies in the coverage of the figures of stocks because the annual or more frequent figures for all this large part of the private sector have not hitherto been collected on a uniform basis. Because some figures were collected on a business basis and some on an establishment basis there was both a lack of correspondence between bench marks and indicators and deficiencies of coverage. More comprehensive and consistent figures will be available for 1959 and onwards.

Board of Trade.