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REPLY TO PROFESSOR HOFFMANN

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Professor Hoffmann in the above note kindly replies to my paper in this Journal,¹ where I made a conceptual criticism on his classification of consumer goods industries and capital goods industries, along with an empirical criticism on his thesis on the pattern of growth of the two sectors in long-term economic development. In this reply, I shall first point out contradictions in his present note and then present a general appraisal of his approach.

To begin with, it is quite necessary to define the terms involved. For this purpose we use the following symbols:

X : total output (production) of manufacturing sector

C : consumer demand for manufactured output

I : investment demand for manufactured output

U : intermediate demand for manufactured output.

For the manufacturing sector, the identity holds:

$$X = C + I + U,$$

where we are neglecting for simplicity the exports of manufactured output which are to be added to the right hand side. Thus, total output of the manufacturing sector (X) is absorbed by final demand ($C+I$) and intermediate demand (U). We can also call the goods of final demand as finished goods (i. e., finished consumer goods and finished capital goods) and the goods of intermediate demand as unfinished goods (or intermediate goods). Then, intermediate goods (U) could be theoretically broken down into U_c and U_i : U_c denotes the intermediate goods ultimately destined to the production of finished consumer goods, and U_i the intermediate goods ultimately destined to the production of finished capital goods. The breakdown could also be done in practice, if an input-output table is available. Therefore, the above identity for the manufacturing sector is written as:

$$X = C + I + U_c + U_i.$$

What matters is how to classify the consumer goods industries and capital goods industries and this is the point which would distinguish between Professor Hoffmann and myself. There are two dimensions in the discussion: theoretical and empirical.

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¹ Y. Shionoya, "Patterns of Industrial Growth in the United States and Sweden: A Critique of Hoffmann's Hypothesis," *Hitotsubashi Journal of Economics*, June 1964.

I

On a theoretical level, we have to distinguish three methods by which to classify the two sectors in manufacturing. Confusion of these methods seems to have led Professor Hoffmann into trouble in his present note. In the *first* method one confines discussion to the finished goods ($C+I$) and regards as consumer goods industries those industries which produce the finished consumer goods (C) and as capital goods industries those industries which produce the finished capital goods (I). In this case the production of unfinished goods (U) is neglected. The *second* method is to regard as consumer goods industries those industries which produce the finished consumer goods (C) and as capital goods industries those industries which produce the finished capital goods and intermediate goods ($I+U$, or $I+U_c+U_i$). This method would be based on the conception of capital in the Austrian School, most clearly reflected in the theory of "Produktionsumwege" by Böhm-Bawerk. The *third* method of classification is to define as consumer goods industries those industries which produce the consumer goods directly and indirectly ($C+U_c$) and as capital goods industries those industries which produce the capital goods directly and indirectly ($I+U_i$).

It would be clear from the following, taken from his *The Growth of Industrial Economies*, that Professor Hoffmann used the *third* method:

"... we have attempted to classify all industries according to the use made of their output. If an industry produces only raw materials and semi-manufactured goods we have examined the nature of the finished product into which those raw materials and semi-manufactured ultimately enter. We have regarded the whole industrial economy as being divided into two sectors which may be distinguished by the type of output—(i) industries which make or contribute to the production of consumer goods, and (ii) branches of manufacture which contribute to the needs of the capital-goods industries." (*The Growth*, p. 5.)

Thus, intermediate goods are classified as products of either sector by checking statistically whether they are indirectly used for the production of either finished consumer goods or finished capital goods. In fact, when he explains practical ways of classification, he writes:

"The textile industries, excluding jute, supply the clothing industry with virtually all its raw materials and are consumer goods industries." (*The Growth*, p. 9.)

"The products of the tanneries may be regarded as part of the consumer-goods industries because they are largely used by the footwear industry and by the leather industries which are themselves both consumer-goods industries." (*The Growth*, p. 9.)

Can we infer from these remarks that he used any other method than the *third*? Moreover, a reference to his *British Industry, 1700-1950* also suggests that he classified the two sectors by the *third* method, although in this case the word producer goods industries instead of capital goods industries is employed:

"Consumer goods include all those finished goods which are ready for immediate consumption and also those semi-finished goods which, although often used in industry, are largely bought by the public in a finished form primarily for consumption in the home. Cotton yarn, for example, may be either a producer-good or a consumer-good. It is a consumer-good if the yarn is woven into cloth and the cloth is finally purchased by the general public. On the other hand cotton yarn is a producer-good if the cloth made from it is consumed by industrial or commercial firms, e.g. in the form of overalls for their employees. This factor in the situation must be borne in mind

when handling output and consumption statistics. Producer-goods, on the other hand, are those products which are used in a finished or a semi-finished form by industry alone." (*British Industry*, p. 73.)

In my own case I adopted the same principle (the *third* method) as the legitimate method of classification, and in my earlier article my criticism of his approach was confined to his empirical procedures in substantiating this principle.

Therefore, it is quite surprising that Professor Hoffmann in his present note argues that the difference between us in dealing with the intermediate goods is basically theoretical. He seems to insist here that he deals with only the finished goods and omits the intermediate goods in the classification of the two sectors, while he claims I include the latter. In other words, he tries to state the difference between us in terms of his employing the *first* method (C vs. I) and my employing the *third* method ($C+U_c$ vs. $I+U_i$). But, this is not true as far as his previous works are concerned, because, as shown above, he himself has used the *third* method.

Even if we confine ourselves to his present note, however, we find he is far from consistent in employing the *first* method. In spite of his explicit statement that he treats only the finished goods, he actually defines in his note the intermediate goods destined to finished consumer goods as capital goods. See his discussion on textile yarn: he now regards it as a capital good, even if it enters into finished consumer goods, although it was precisely treated as a consumer good in his previous books. It follows that he now seems to have shifted from the *first* to the *second* method of classification (C vs. $I+U$), as far as this example is concerned.

Fortunately, I could examine Table 1 of his note in order to infer what he has really in mind. I checked the input-output tables which he used as the basic source and found out how he constructed the ratios in Table 1, although the ratios were hard to reconstruct for Great Britain. I found that in Table 1 the figures for ten major sectors of manufacturing in the column for consumer goods are calculated as the ratios of private consumption demand to total final demand, while for the USA the ratios are calculated against total demand (not final demand.) In all cases, the ratios of capital goods are obtained as the residuals from 100. Therefore, we could say that in Table 1, except for the USA where the *second* method (C vs. $I+U$) is applied, Professor Hoffmann maintains the *first* method (C vs. I). It is due to such difference in the methods of calculation that in Table 1 the ratios of consumer goods for the USA appear lower than those of other countries; for this reason we can not directly compare the US figures with others.

There are still other shortcomings in Table 1. For West Germany, the USA and Great Britain the ratios are calculated for domestic output, but for France, Italy, Netherlands and Belgium the ratios are calculated for the totals of domestic output *plus* imports. For this reason, the ratios for the two groups of countries are not strictly comparable. Furthermore, since in Table 1 the consumer goods cover only private consumption and the capital goods are counted as residuals in the final demand, the capital goods must include government consumption and exports as well as capital formation. How can one plausibly argue that the goods for government consumption and exports should belong to the capital goods?

From the preceding observations we can perhaps conclude that in spite of several inconsistencies and shortcomings in his present note, Professor Hoffmann now relies on the *first* method (C vs. I) and that his present approach differs from his previous one which

was based on the *third* method ($C+U_c$ vs. $I+U_i$).

II

Let us now turn to the empirical dimension of his work and observe how he has applied the theoretical principle of classification to actual statistics. It puzzles me that he seems to have changed his theoretical principle from the *third* to the *first* method without any remarks. But, to be comprehensive I shall criticize his empirical approach in both cases of employing the *third* and *first* methods.

Whichever method he may claim theoretically, it is beyond question that in his books he actually used an "industry output approach" in the statistical classification. By the "industry output approach" I mean the procedure by which one classifies aggregate output of an industry either as consumer goods or capital goods without breaking it down into different categories. Thus, Professor Hoffmann constructed the consumer goods industries by aggregating the output of four industries (food, drink and tobacco, clothing and footwear, leather goods, and furniture) and the capital goods industries by aggregating the output of another four industries (ferrous and non-ferrous metals, machinery, vehicle construction, and chemicals). But, in reality, most industries produce finished consumer goods (C) and capital goods (I) as well as unfinished goods (U). Therefore, he had to design a rule of thumb when he wanted to identify statistically an industry as either a consumer goods industry or a capital goods industry. Such a rule was what might be called a 75 percent test in his case (*The Growth*, p.5). What a 75 percent test means in statistical calculation depends on a theoretical criterion which is adopted in the classification of consumer goods and capital goods.

Since, as I mentioned earlier, he adopted the *third* method as a theoretical definition of the two sectors in his books, a 75 percent test as a statistical device for classifying the two sectors implies the following procedure: if $C+U_c$ (or $I+U_i$) of an industry is more than 75 percent of total output (X) of that industry, it is regarded as a consumer goods industry (or capital goods industry); and if this test is not met for an industry, it is omitted from the scope of the two sectors. In fact, in his *Growth*, industry by industry, the use of output is treated in terms of the *third* method. As an example of his approach, the reader is referred to my quotations in the preceding section from his *Growth* for textile industry and leather industry. In short, he examined in his book the destination of unfinished goods and assessed the proportions of ($C+U_c$) and ($I+U_i$) in the total output of an industry in his 75 percent test.

But, in his note, he now shifts to the *first* method and calculates the proportions of C and I in the total final demand ($C+I$) of an industry by using recent input-output statistics, although he does not mention explicitly a 75 percent test. In other words, he tries to support the previous classification of the consumer goods industries and capital goods industries by a different criterion (i. e. the *first* method). This "industry output approach" to the classification of the two sectors is misleading for the *third* as well as the *first* method in that the output of an industry never corresponds to a single use, while this approach defines the aggregate output of an industry simply as either the consumption or investment use. The application of the *first* method in an "industry output approach" would be more defective than the *third* because, on the demand side, it entirely neglects the intermediate goods; on

the supply side, it still includes in the net output of the two sectors the value added which originates from the production of the intermediate goods. Structure of the final demand is not the same as structure of intermediate demand.

If Professor Hoffmann is really concerned with the changing pattern of production structure in terms of the two sectors, the output of each sector should be estimated on the basis of an "economic use approach", by which I mean a breakdown of the output of an industry in exact accordance with its economic use. On the other hand, if the purpose of his study is to observe the changing structure of final demand for manufactures, he need not have constructed the two sectors of production; he had only to deal with the final demand itself without jumping from it to value added. Of course, I am perfectly sympathetic with Professor Hoffmann who had made great efforts to compensate for insufficient data. But his results based on an "industry output approach" cannot be accepted as even rough measures of output of the consumer goods industries and capital goods industries; they are simply measures of output of his specifically selected industries. His findings might indicate a specific version of the changing proportions of "heavy" and "light" industries of manufacturing in the process of industrialization.