

## THE GROWTH OF INDUSTRIAL ECONOMIES

By WALTHER G. HOFFMANN\*

Prof. A. M. Lago has recently made some critical remarks about the thesis, that during industrialization capital goods industries grow faster than consumer goods industries,<sup>1</sup> I have answered to these remarks in an article: "Antikritisches zu Stadien und Typen der Industrialisierung".<sup>2</sup> As these remarks are written in the German language, I will try to discuss the problem now for English readers along with the article of Prof. Shionoya in this journal.<sup>3</sup>

The central point of the criticisms from both sides—Prof. Y. Shionoya and A. M. Lago—concerns the classification of consumer goods industries and capital goods industries. The difference between Shionoya and Lago and myself is the question whether the intermediate products play a role in the analysis. In my book I have used only the final or ultimate demand, but Shionoya and Lago include the intermediate demand. I define as consumer goods industries those industries whose product is going to households. Capital goods industries on the other hand are those industries, whose products are bought by firms. Therefore, textile yarns are capital goods, so far as they are bought by firms. But according to Shionoya and Lago these yarns are consumer goods because the final output, i.e. the clothing, is bought by households.

These theoretical differences between us may be the last reason for the difference in statistics. Principally I can formulate therefore: so far a relation of consumer goods to capital goods for the intermediate demand is the same as for the final demand so far is no difference at all between us. But there may be difference between us, so far this difference is great. In this case it would be necessary to make an exact calculation.

If input-output tables were available for the 19th century, the best solution would be to calculate each single case; but everybody knows that such tables are not available. In my dissertation I came therefore to the conclusion to leave out textile industries<sup>4</sup> as well as some other industries. In practice, I decided to leave out all dubious cases and to deal only with the following industries:

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\* Professor of Economics, Westfälische Wilhelms-Universität, Münster.

<sup>1</sup> For Germany 1850–1959 see W.G. Hoffmann, *Das Wachstum der deutschen Wirtschaft seit der Mitte des 19. Jahrhunderts*, Berlin 1965, p. 63.

<sup>2</sup> W.G. Hoffmann, "Antikritisches zu Stadien und Typen der Industrialisierung", *Weltwirtschaftliches Archiv*, Band 104, (1970), pp. 127/137.

<sup>3</sup> Yuichi Shionoya, "Patterns of Industrial Growth in the United States and Sweden: A Critique of Hoffmann's Hypothesis", *Hitotsubashi Journal of Economics*, Vol. V, No. 1, 1964, pp. 52 sqq.

<sup>4</sup> W.G. Hoffmann, *The Growth of Industrial Economies*, Manchester 1958, p. 16.

consumer goods industries	capital goods industries
1. Food, drink, tobacco	5. Ferrous and non-ferrous metals
2. Clothing and footwear	6. Machinery
3. Leather goods	7. Vehicle construction
4. Furniture	8. Chemicals

If I use the few input-output tables available for recent years (Table 1), we get the following results: In the majority of cases the food industry seems to produce consumer goods. But experience shows also exemptions in USA 1919 and 1929, Netherlands 1959, United Kingdom 1935. Textile industry is dubious. Clothing industry—with the exemption of USA 1929—is in all cases a consumer goods industry. Leather as well as paper industry and printing are not clear. On the other side ferrous and non ferrous metals, machinery vehicle construction and chemical industry are nearly in all cases capital goods industry. The only exemption is Italy 1959.

This list of industries is the same as in my book.<sup>5</sup> About 2/3 of value added of each industry is included. Naturally, the best solution would be to calculate exact figures with input-output tables; but I repeat, they are not available in the 19th century. It is necessary to make rough estimates.

May I give an example. If—in absolute value added—we would have in the first period 99, in the next period 200 and in the third period 400 dollars in consumer goods, we would have an increase of 100% from period to period. If at the same time we would have in the first period 1, in the second period 200 and in the third period 800 dollars in capital goods, the capital goods are increasing much faster than consumer goods industries, i.e.

$$\frac{99}{1} \quad \frac{200}{200} \quad \frac{400}{800}$$

If the relation is more or less the same for the intermediate goods, the sum of intermediate and final demand would give the following picture:

$$\frac{198}{2} \quad \frac{400}{400} \quad \frac{800}{1600}$$

i.e. the relation would be

$$\frac{99}{1} \quad \frac{1}{1} \quad \frac{0,5}{1}$$

Here it is clear that the structure of final demand is the same as that of intermediate demand. In this case the structure of final demand—which I have chosen in my work—is typical for the structure of total demand. How far my arguments are the same as those of Shionoya and Lago, in all other cases, depends on the extent of the difference between intermediate and final demand.

There remains still the question which method should be given priority in studying the growth process. This can only be answered if one realizes the purpose of the research of Shionoya and Lago on the one side and myself on the other. If one defines consumer goods as technically finished goods, one has to give priority to my method which uses final demand, neglecting the intermediate demand. The theoretical aspect has been formulated by Böhm/Bawerk in his theory of "Produktionsumwege", which states that during the growth process the "Produktionsumwege"—i.e. the roundaboutness of production—are permanently prolonged.

If on the other hand, one would like to know the inputs of capital goods necessary to

<sup>5</sup> W.G. Hoffmann, *The Growth of Industrial Economies*, p. 16.

TABLE 1. FINAL DEMAND OF CONSUMER GOODS AND CAPITAL GOODS INDUSTRIES IN DIFFERENT COUNTRIES (%)

	West Germany 1954 <sup>1</sup>		West Germany 1958 <sup>2</sup>		West Germany 1960 <sup>3</sup>		USA 1919 <sup>4</sup>		USA 1929 <sup>5</sup>		USA 1939 <sup>6</sup>	
	consumer goods	capital goods	consumer goods	capital goods	consumer goods	capital goods	consumer goods	capital goods	consumer goods	capital goods	consumer goods	capital goods
1 Food, drink, tobacco	87	13	79	21	95	5	68	32	77	23	75	25
2 Textile goods	61	39	69	31	74	26	33	67	29	71	29	71
3 Clothing	94	6	94	6	89	11	92	8	59	41	95	9
4 Leather goods	87	13	85	15	—	—	46	54	60	40	68	32
5 Paper goods	70	30	70	27	35	65	12	88	8	92	7	93
6 Printing	70	30	68	32	74	26	—	—	21	79	25	75
7 Ferrous, metal goods	4	96	3	97	13	87	5	95	—	—	—	—
8 Machinery	5	95	4	96	9	91	—	—	—	—	—	100
9 Vehicle construction	11	89	17	83	20	80	34	76	32	68	18	82
10 Chemical goods	29	71	21	79	37	63	22	78	27	73	30	70
	France 1959 <sup>7</sup>		Italy 1959 <sup>8</sup>		Netherlands 1959 <sup>9</sup>		Belgium 1959 <sup>10</sup>		Great Britain 1935 <sup>11</sup>			
	consumer goods	capital goods	consumer goods	capital goods	consumer goods	capital goods	consumer goods	capital goods	consumer goods	capital goods	consumer goods	capital goods
1 Food, drink, tobacco	93	7	95	5	68	33	93	7	69	31	69	31
2 Textile goods	53	47	66	34	49	51	31	69	76	24	76	24
3 Clothing	92	8	88	12	87	13	86	14	89	11	89	11
4 Leather goods	48	52	81	19	46	54	39	61	21	79	21	79
5 Paper goods	30	70	43	56	12	88	23	77	—	—	—	—
6 Printing	78	22	87	13	66	34	48	52	—	—	—	—
7 Ferrous, metal goods	3	97	—	100	17	83	1	99	2	98	2	98
8 Machinery	11	89	6	94	11	89	14	86	9	91	9	91
9 Vehicle construction	27	73	27	73	12	88	37	63	3	97	3	97
10 Chemical goods	58	42	75	25	28	72	32	68	23	77	23	77

Sources: 1. 2. 3. Deutsches Institut für Wirtschaftsforschung, *DIW-Berträge zur Strukturforchung*, Heft 1 1967, Heft 4 1968, Heft 6 1969 Anhang.

4. 5. 6. W. W. Leontief, *The Structure of American Economy 1919-1939*, Anhang: Falttabellen. Leontief, *Studies in the Structure of the American Economy*, New York 1953.

7. 8. 9. 10. *Input-Output-Tabellen für die Länder der EWG* (2. Fassung), Hrsg. Statistisches Amt der Europäischen Gemeinschaften, Brüssel, Dezember 1965.

11. *Journal of the Royal Statistical Society*, Serie A 155, 1952, pp. 50/51.

produce a fixed volume of consumer goods, one has naturally to include intermediate demand. In this case there is the problem of changing input-output coefficients over time how far—under static aspects—in different periods more or less capital goods are necessary in order to produce a fixed volume of—for instance—clothing. Naturally I agree that this is a very interesting question; but in this case it would be necessary to have a complete set of input-output tables for the 19th century. Because they are not available, there remain only rough estimates. If one gets further results in this way, their validity depends—as I tried to show—on the extent of the difference between the structure of intermediate and final demand.