PRICE COMPARISONS OF IDENTICAL PRODUCTS IN JAPAN, THE UNITED STATES AND EUROPE

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FOREWORD

The promotion of an environment in which the multinational research-based pharmaceutical industry can flourish has been and will continue to be reliant upon a well-informed and widely-disseminated understanding of the economics underpinning its complex operations. Throughout the 1970s OHE has played an important part in this 'educative' process with specific investigations into areas such as the nature of competition within the industry, the use of brand names in prescribing and the role of sales promotion. But it is perhaps the prices obtained by companies for their products that has been at the forefront of concern. The survival of the industry, and hence the well being of the people it serves, is dependent upon innovation. The latter requires substantial funds to be channelled into research and development activities and this can only be achieved if current sales carry with them an adequate level of return above manufacturing and other costs.

Yet the concept and determination of an appropriate pharmaceutical price level are the subjects of considerable controversy. One source of guidance has been sought through comparisons of international prices. Unfortunately, differences in regulatory/reimbursement systems and in corporate strategies coupled with inconsistencies between methods of administration, dosage strengths and usage patterns of apparently similar products have severely inhibited investigations embracing two or more national markets. The present paper by Duncan Reekie, however, marks a new departure. Drawing upon data made available by eight leading multinational pharmaceutical companies Reekie adopts a unique analytical framework which enables him to compare price levels and to examine the significance of various economic indicators, including exchange rate fluctuations, in generating the differences observed between Europe, the United States and Japan. It is shown that while European prices are very close to those found in the US both are approximately half the levels prevailing in Japan. The significance of this for the future of Japan's progress in pharmaceutical innovation and its eventual penetration of world pharmaceutical markets needs to be carefully considered.

Although these broad results have been reported elsewhere, OHE considers that the investigation merits publication in its entirety because of its novel and comprehensive methodological approach and its portentous findings. As such the study appears as the first in a new occasional series of Pharmaceutical Industry Research Papers.

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1. INTRODUCTION

This paper reports on a study of eight leading multinational pharmaceutical firms each of whom markets products in Europe, the United States and Japan. One motivating factor behind the exercise was that increasingly governments and academics have resorted to international price comparisons to ascertain whether or not a given firm's price range or a given product's price was 'fair' (NEDO 1972; Cooper, 1975). A second factor is that no previous comparisons have employed the methodology used here.

2. PREVIOUS STUDIES

Earlier work in this area has either been restricted to one or to an unrepresentatively small number of products, (Monopolies Commission, 1973; Royal Canadian Commission on Health, 1964, pp. 677-9); or alternatively, to virtually all products available in a given control country (usually the UK) for which comparable products were available elsewhere (Cooper, 1966). This latter approach appears to have the virtue of total comprehensiveness. But, in fact, from a total of 2500 products available in Britain only 79 important products (by British sales value) could be directly compared with their German equivalents. This figure fell to 42 when a comparison was made between the British and Italian markets (Cooper, 1966, p. 122). Moreover, since the Cooper studies (1966, 1975) used the UK as a base from which to draw a sample the resulting comparisons were of Britain with each of the other countries in turn. They were not juxtapositions of 'analogous drugs' in a range of countries.

Valier (1959 and 1961) attempted to do this by restricting himself to six national markets and examining directly comparable drugs available simultaneously in each market.

Only eighteen products were deemed directly comparable, however, and a further forty required standardisation by either pack size or dosage form before a price comparison could be made. As Cooper (1966,p.141) pointed out 'the actual number of fifty-eight would not have mattered, given that they were the *right* fifty-eight, which is . . .highly improbable' (emphasis in original). Cooper was correct since on a product basis, the pharmaceutical industry does not have a diffuse market structure. In most countries well over half of all sales by value are made by well under half the number of available products. At any point in time, however, the mix of the leading products, varies widely from country to country according to medical convention, disease incidence, legislative and commercial factors (Reekie, 1975,pp. 62-70). Thus to find even a small number of drugs common to all markets is not enough. The products must all be important in their respective markets. If they are not all commercially important then any results calculated would be biased towards minimising overall price differences. This is because, given the normal negative relationship between price and quantity, many relatively highly priced products would be studied (Frisch, 1947,pp. 21-36). Moreover, the products which contribute most to consumer satisfaction or medical care could thus be ignored in one or more countries.

In addition, product similarity and duplication may mislead the analyst. For meaningful price comparisons from which inferences can be drawn about national pricing practices, transfer price policies and the like, the marketing company must be the same (or have the same corporate parent). If it does not then the wide variety

of royalty and licensing arrangements which are possible can dramatically alter the prices which are charged. For example, this was the situation in the UK when Roche Products Ltd. charged both Berk and DDSA Pharmaceuticals an absolute royalty based on weight of chemical sold and not, as is more usual, a percentage of sales value achieved. This set a floor beneath which the licensees could not price and survive (Polanyi, 1973, p. 49). It was decided that a different approach could be justified in the present examination.

First, the 'comprehensive' approach of Cooper would not be repeated since it had proven to result

(a) in only a small number of product comparisons in any event

and

(b) since the starting point for the sample design was the country (generally the UK) the product juxtapositions were of each country with the available drugs in Britain, not of each country's analogies.

Second, the 'analogous drug' approach of Valier was rejected because again the starting point was the country rather than the firm or the product. This resulted in product comparisons between a small number of not necessarily important products.

Moreover, there is a wide variety of marketing methods for pharmaceuticals by country and their fiscal treatment is also varied. For example, in the USA a high proportion of medicines are paid for directly by the general public (albeit after prescription by a doctor). The price paid by the public will depend on what the manufacturer's selling price was, what wholesale margin was levied, what retail margin was obtained by the dispensing chemist and what level of sales tax was raised at each stage of the distributive process. At each stage these will influence what 'price' is. They will vary state by state (in the case of taxes) and possibly even transaction by transaction in the case of discounts awarded or gained.

In Europe Nelson (1980) has shown that the mark-ups levied by wholesalers, retailers and the national tax authorities can range from 154% in Austria to 43% in Greece and Portugal. His full listing is given in Table 1. In addition, the 'price' ultimately

TABLE 1

Trade Margins on Price Paid by Public Including National Taxes (Price paid to Manufacturer by Wholesaler = 100)

Austria	154	Finland	83
W. Germany	111	France	80
Denmark	110	Sweden	78
Norway	100	Belgium	77
UK	98	Spain	65
Eire	94	Italy	58
Switzerland	88	Greece	43
Netherlands	86	Portugal	43

Source: J D E Nelson, 'International Price Comparisons', Unpublished talk, American Management Association, Zurich 1980

charged to the 'public' will vary with the method of financing of health care and the presence or absence of resale price maintenance (RPM). In the UK the monopsonistic National Health Service negotiates prices with the industry through the Pharmaceutical Price Regulation Scheme, dispensing chemists reimbursement levels are fixed by government, and RPM – or 'a fair trade law' – is in force. In other countries the public themselves pay market determined prices directly to the retailer to either a greater or a lesser extent. RPM is not universal and the tax treatment of distributors differs.

3. THE CURRENT STUDY

The present investigation examines prices at the level of the manufacturer. First, and most importantly, it is manufacturers' net receipts about which governments and others are most universally concerned. Second, the 'comprehensive' type of studies mentioned above examined chemists' buying prices net of tax, but including wholesalers' margins. Although valiant attempts were made to remove the complexities of the tax factor, which varies not only internationally but in some cases changes rate according to product price (NEDO p. 19) the problem of differing wholesale margins remained.

It was decided, therefore to approach manufacturers directly and obtain from them their selling prices, net of all taxes and wholesale and retail margins. The eight companies selected for the sample were chosen non-randomly solely on the basis of whether or not they would cooperate in the provision of information. Of the eight firms who agreed to assist there were representatives from Switzerland, Germany, the UK, the USA and France. Each of the sample members were included in 1970's top 38 pharmaceutical firms selling world-wide. Table 2 shows the sample is biased towards the larger firms in the population. It accounted, in 1970, for around 28 percent of all world wide sales.

TABLE 2 Leading International Pharmaceutical Firms, 1970

	Total World Pharmaceutical Sales (1970) ($m)	*Average Sales*	*Maximum*	*Minimum*	*Standard Deviation*
All Firms	9968	262	840	53	177
Sample Firms	2765	345	840	67	251

Source: Extracted from the draft Report of the Pharmaceuticals Working Party, Economic Development Committee for the Chemical Industry. (A UK government body on which the author served.)

The selling prices of the top five products of each firm were obtained for each of Japan, the USA, the UK, Germany, France and Italy. In each case the price obtained was for the most commonly sold pack size. The number of products (five) is arbitrary. However, as pointed out above only a few leading products account for most of a company's sales. Von Grebmer (1978) calculated that in one European country fifty percent of the ten leading firms' sales by value was accounted for by five percent of their products by number. In the UK Reekie (1975,p. 127) found a similar situation. The leading twelve firms sold 526 products, but of these a mere 28 (approximately 5 percent) accounted for 58 percent of sales on average.

The top five products per firm were therefore deemed to represent each company's major sellers. Clearly the number of possible products examined had a lower bounding figure of forty and an upper bound of two hundred and forty. However, although the same leading five products in one market were not always identical to the eight firms' five leaders in another of the six national markets, they did overlap to a considerable degree and the number of products studied was much closer to the lower than the higher figure. In fact, the total number of products examined was 56, and in the case of one firm only four product prices were obtained since only four products were sold commonly in the sample countries, and no other single product had significant sales in even one of the national markets examined. The raw data were collected by postal questionnaire and follow-up communications were made in each case where unexpected responses of this type (i.e. information on only four products being obtained) cast initial doubts on the accuracy of the response.

4. SOME PROBLEMS IN THE STUDY

Restrictions were placed on both the calculation and the presentation of the results. First, not all of the sample products were sold in each of the sample countries. Thus comparisons had to be made between economic blocs in turn rather than with each of them simultaneously. This had to be done to maintain sub-sample comparability. Second, 'Europe' as an economic entity was restricted to four countries (the UK, France, Germany and Italy) for similar reasons. Third, the data were only made available on condition that the European results would not be disaggregated and so intra-European comparisons made public.

Some general problems of international price comparisons had also to be overcome. First, because of varying legal requirements and distributive mechanisms typical pack sizes sometimes vary immensely between markets. Thus in France and Germany pharmacists are compelled by law to dispense the manufacturer's original pack to the patient (to ensure that all relevant product information is passed on to him). In Japan, Italy, the USA and the UK this is not so. The product is broken up and repackaged in smaller amounts by the chemist. Thus French and German packs tend on average to be below the size of those in the other countries. Other things equal, if prices are related positively to manufacturing and packaging costs and if scale economies are present then French and German prices will be higher than those for other countries. This difficulty can be partly overcome by calculating each price in per unit terms (capsule, tablet, cream per gram, liquid per millilitre, ampoule, etc.) then, if the most commonly sold pack in any country is different from that sold in other countries, standardising its price to that of the most frequently sold pack internationally. When this is done the French and German average price falls *vis a vis* the British, Italian and Japanese prices. The individual quantitative results cannot be shown here given the conditions under which the data were supplied but they did reflect what was intuitively expected.

Second, pack size standardisation must also be carried out when, as often happens, the presentation of the product differs. (For example, in some countries a 125 mg capsule may be modal, in others the relevant presentation may be 250 mg units.)

Third, in some therapies the pack and the unit are often identical or nearly so. This is particularly the case with injectable ampoules. Ampoule prices are consequently 'high' when compared with the prices of other units such as tablets

(which may be consumed by patients in lots of 25 or 100 per treatment compared to the single unit dosage of an ampoule). It would be expected, therefore, that the average price per pack would generally be biased downwards relative to the average price per unit.

Finally, although the results are presented in index number form, no attempt was made to weight the products by sales per country. This omission was due to lack of data availability. It would have been possible to weight the products by therapeutic market size as has been done by Cooper (1966,p. 123.) However, Cooper discovered this made little difference to his conclusions. (In Italy, France, Spain and Germany the differentials resulting from this weighting exercise were 0%, 4%, 7% and 15% respectively.) Of greater importance is the observation that weighting by sub-market sales (e.g. weighting one antibiotic product by all antibiotic sales in a given country relative to all pharmaceutical sales) is only a proxy for the purposes of this study. Certainly it helps embody differing national medical practices or therapeutic requirements in the model (e.g. antibiotics are relatively more frequently prescribed in northern than in southern Europe; for tonics and vitamin preparations the reverse is true.) But in this study differing European morbidity patterns probably also occur, for similar climatic reasons as in the USA. In addition, and most importantly each of the products examined is a critical and major product to the company concerned. Thus to weight it by either its own sales or by its own sales plus those of its therapeutic market competitors in addition is somewhat redundant. The sample already consists of self-selected 'heavily-weighted' products both from the commercial viewpoint of the firm and from the viewpoint of the consuming nation. Trivial products in tiny market segments have already been excluded from the study by the nature of its sample design.

What is being compared are the prices of all the major products of a sample of major firms in the three largest drug markets in the world. (Reekie and Weber, 1979 p. 28).
The results are presented in tables 3, 4, 5 and 6.

TABLE 3 Products in Common Between Japan and the USA (US Price = 100)

		(A) Japanese Price per Standardised Pack	*(B) Japanese Price per Dosage Unit*
1)	Price in dollars	206	228
2)	Price in minutes of work	231	254
3)	Price in 'effort units'	248	275
4)	Price in dollars deflated by GDP per capita	275	304
5)	Price in dollars deflated by physicians per capita	293	324

TABLE 4 Products in Common Between the USA and Europe (European Price = 100)

		(A) US Price per Standardised Pack	*(B) US Price per Dosage Unit*
1)	Price in dollars	89	90
2)	Price in minutes of work	74	68
3)	Price in 'effort units'	65	65
4)	Price in dollars deflated by GDP per capita	78	78
5)	Price in dollars deflated by physicians per capita	90	91

TABLE 5 Products in Common Between Europe and Japan (Japanese Price = 100)

		(A) European Price per Standardised Pack	*(B) European Price per Dosage Unit*
1)	Price in dollars	58	64
2)	Price in minutes of work	68	74
3)	Price in 'effort units'	65	72
4)	Price in dollars deflated by GDP per capita	50	59
5)	Price in dollars deflated by physicians per capita	40	44

TABLE 6 Products in Common Between the UK and Europe (including the UK) (European Price = 100)

		(A) British Price per Standardised Pack	*(B) British Price per Dosage Unit*
1)	Price in dollars	92	100
2)	Price in minutes of work	112	122
3)	Price in 'effort units'	118	127
4)	Price in dollars deflated by GDP per capita	113	122
5)	Price in dollars deflated by physicians per capita	101	110

Notes and Sources

1) GDP per capita computed from data in *IMF Yearbook, 1980, International Financial Statistics,* IMF, Washington, 1980.
2) Exchange Rates and GDP per capita in U.S. dollars as in note 1.
3) Hours of work per week in All Manufacturing Industry and Average Earnings per Hour in U.S. dollars were taken from the *1979 Yearbook of Labour Statistics,* ILO, Geneva, 1979.
4) Physicians per 10,000 population obtained from the *WHO Statistical Annual 1977,* Geneva, 1977.
5) Earnings per 'effort unit' was computed by dividing earnings per hour (in dollars) by hours of work per week.
6) Price in minutes of work was computed by dividing the product price by earnings per hour and multiplying by 60.
7) Price in 'effort units' was computed by dividing product price by earnings per 'effort unit'.
8) Relative prices adjusted by the relevant GDP and physicians per capita deflators are self-explanatory except in the case of Europe.
9) The overall European prices used in Tables 4, 5 and 6 were calculated using the simple arithmetic average of the national prices. This appears an acceptable approach given that the populations of the four nations were not dissimilar at 53, 56, 57 and 61 million for France, the UK, Italy and Germany respectively. Similarly for consistency the 'European' figure for GDP per head and physicians was obtained using the simple mean.

5. RESULTS

The prices are calculated (in index number terms) in dollars per pack and in dollars per dosage unit at the ruling exchange rates as given in the 1980 IMF Yearbook. Subject to all of the previous discussion, Japanese prices appear to be approximately twice those of American levels (Table 3) and a little under twice those of European levels (Table 5). This implies that European prices are somewhat above those of the USA (as was found to be so, Table 4).

However, these figures depend on calculations made at international exchange rates and the simple purchasing power of money in its domestic environment does not necessarily explain its foreign exchange value. Yet in row 1 of the tables foreign exchange values have been implicitly used to compare the purchasing power sacrificed by consumers to buy comparable products. Row 2 in each table attempts to overcome this by examining the prices in terms of minutes of work required to purchase the products. The disparity between American and Japanese prices grows in Table 3. This reflects the higher earnings per hour of the US worker. The European price disparity with Japan shrinks, since three of the countries (Italy, France and the UK) have hourly earnings well below those in Japan and the West German figure of $7.14 per hour is insufficient to offset the lower earnings in the other countries. (The figures were $4.71, $4.06, $4.15 and $5.96 for France, Italy, the UK and Japan respectively.) For similar reasons, the British price *vis a vis* the European, rises in Row 2 of Table 6, and this is despite the fact that the UK is included in both numerator and denominator of the index number calculation.

Earnings per hour, however, is only one measure of income. It may simply reflect labour productivity differentials. Thus products could be 'inexpensive' in rich countries and relatively costly in those with lower productivity per hour. In the six nations examined there was a thirteen percent spread in hours of work spent per week in manufacturing industry (lowest as a percent of highest). The UK and USA, for example, having average working weeks per head of 43.5 and 40.4 hours respectively. If it is assumed that such figures would be little affected by the practice of 'moonlighting' or the holding of more than one full time job then since it is difficult for the average worker in an economy to adjust either his total hours worked or his productivity then some other measure than earnings per hour may be appropriate to calculate real income per head adjusted in some way for productivity and leisure time foregone. In this exercise 'earnings per effort unit' has been devised to ascertain the impact of these effects. Since 'earnings per effort unit' (EPEU) equals earnings per hour divided by hours worked per week EPEU will be smaller the longer the working week, other things equal and vice versa. In turn, EPEUs will be larger the shorter the working week. Thus, when prices per EPEU are calculated the differential attributable to variations in working week length should be highlighted when these prices are compared with the equivalent prices expressed in minutes of work.

In row 3 of Table 3 the Japanese price in effort units rises still further in relation to the American price. This reflects the longer Japanese working week. In row 3 of Table 4 the price in the USA falls relative to the European price (reflecting the shorter working week in the USA relative to all European countries, except Italy at 38.5 hours). The similar average working week in Europe and Japan is such that the price differential indicated by comparing rows 2 and 3 of Table 5 is trivial. In Table 6, however, the longer British working week and probably associated lower productivity (relative to the European average including the UK) is such that the British price, measured in effort units, rises relative to the figures in rows 1 and 2.

Thus prices did change as casual observation might have suggested. America enjoys greater per capita productivity than the other economic blocs studies. And the use of EPEU adjustments to prices measured simply in minutes of work helps emphasise this. US prices are lower than Japanese or European ones when measured by the latter technique. This may partly reflect productivity differences. But when the prices are recomputed using EPEU's, which explicitly emphasise the fruits of superior productivity, the US prices are adjusted still further downwards albeit not dramatically. In rows 4 and 5 of each table the price in dollars in row 1 is modified by another measure of income per head, namely GDP and one of welfare, namely physicians per capita in the population. GDP is an alternative to either hourly earnings or earnings per effort unit. Since it is not perfectly correlated with income received per head, and since in many countries pharmaceuticals are paid for either directly by the state or by patient reimbursement from the state or other bodies then GDP may be a more appropriate price deflator than earnings received. In the case of physicians, not only are they an index of income or welfare, but pharmaceuticals by and large cannot be sold without the presence of a prescribing doctor, irrespective of payment or reimbursement scheme.

As can be seen (from Table 3) the Japanese price rises again relative to the USA figure; Japanese GDP is less per head than American, and the market potential or welfare measure of physicians is only 11.6 per 10,000 population compared to 16.5 in the USA. In Table 4 row 4 the American price is seen to be a little lower than the unmodified dollar price due to Europe's slightly higher average GDP (mainly due to the West German GDP figure, but partly also to the French). The relative wealth of two countries in Europe in terms of physicians (19.4 and 19.9 for West Germany and Italy respectively per 10,000 population) do little to change the US price in row 5, however. (Certainly France and the UK have equivalent figures of only 14.7 and 13.1) In Table 5, the relatively high GDP figures per capita for Germany and France are partly offset by Italy's and the UK's lower figures. In row 5 of Table 5, however, where all four European countries are better off in terms of physicians than Japan (at 11.6 per 10,000 population) the effect on the dollar price is more obvious, falling by around 20 points on either a pack or unit basis.

The UK's relatively low GDP, like its other income measure, hourly earnings, results in an UK price in row 4 Table 6, almost identical to that in row 2. (Only Italy is below the UK in size of per capita GDP in the four European countries). The UK, however, is relatively better off in terms of physicians per head than in terms of GDP per head and so in Table 6 row 5 the price indices fall back again to the figures shown.

Alternatively, instead of attempting to take account of purchasing power variability and the like by the method used in Rows 2 onwards of the various tables, (each of which was calculated at the same point in time as Row 1), one could recompute the various rows 1 at differing points in time to account for exchange rate fluctuations *per se.*

Frequent and substantial changes in currency rates of exchange can make any price comparison between countries both obsolete and meaningless. For example, consider a product priced at a given monetary level in both the UK and West Germany in 1970 and assigned an index value of 100 in sterling terms. That same product would, if the money prices in each market remained the same, still have an index price of 100 in the UK. But in West Germany, if the unchanged Deutschmark price was converted into sterling on the 1st January, 1980 then it would be found to have a sterling index figure of 231. Thus in 1970 the products would appear to be identically priced. In 1980 the German price would appear to be more than double the British figure. Meanwhile the product itself had been subject to no monetary price adjustments in either market.

The earlier tables used exchange rate data from the 1980 IMF Yearbook. This made for consistency in the calculations of GDP and GDP per capita which were based on data abstracted from the same source. To ascertain how sensitive the results were to using more recent exchange rate figures the price per pack in dollars was recomputed for each of Tables 3, 4, 5 and 6 and the outcome is presented in Table 7. The exchange rates used were those of early February, 1981, a date soon after the final questionnaire was returned and around one year after the exchange rates used previously.

TABLE 7 Dollar Prices per Pack Calculated at Exchange Rates Ruling in 1980 and 1981

		1980	*1981*
1)	Japan (USA = 100)	206	243
2)	USA (Europe = 100)	89	104
3)	Europe (Japan = 100)	58	43
4)	Britain (Europe = 100)	92	101

How important exchange rate movements are in distorting results of the kind detailed earlier in this paper is highlighted in Table 7. Again the main conclusion is that interpretation of international price comparisons is a task fraught with difficulties and one from which only the pretentious would draw policy conclusions.

As a consequence of the yen appreciating by around 18% against the US dollar in the period examined the Japanese price ratio, relative to American products rose to 243. Not only did the dollar fall in value against the yen, it also did so against the pound sterling. However, each of the other European currencies fell against the dollar by more than offsetting amounts with a consequential apparent price increase in the USA *vis a vis* Europe to an index figure of 104. All European currencies fell relative to the yen (including the pound) and so the European price index number suffered the drop shown. Finally, the appreciation (around 5%) of the pound (from $2.22 to $2.34) coupled with the more substantial falls in the value of the mark, lire and franc, (of around 20% against the dollar in each case) resulted in the British price rising relative to the 'European' average.[1]

6. CONCLUSIONS

Irrespective of the exchange rate used or the measure adopted for calculating prices it appears that drugs in Japan are priced consistently higher than their European or American equivalents. The question is begged as to why this should be so. One can only speculate. It seems possible, however, given knowledge of the industry, that price controls are in many countries strict and rigid except in Japan. To the extent that governments hold down prices by suasion or dictat (and so presumably affect profits) in countries other than Japan then there will be a movement of resources into pharmaceuticals in Japan, and a movement away from this industry in other

[1] The apparently small absolute UK price rise given these exchange rate variations is due to the equal weighting given to each European currency's dollar value in calculating the value of a 'European' currency unit. Moreover, the British pound was included in the 'European' currency and so appeared in both numerator and denominator of the UK : Europe comparison. The near uniform change of the values of the other three currencies was probably at least in part due to the mechanics of the European Monetary System (EMS) which has existed since March 1979. Britain is not a member of the EMS, a scheme with certain similarities to the pre-1971 IMF fixed-exchange rate system.

countries. There is ample evidence of this latter trend (e.g. Virts and Weston, 1980). Pharmaceuticals could thus follow shipbuilding and automobiles as victims of Japanese competition. There is no reason for disquiet about this if it is the result of genuine comparative advantage. If, however, it is the outcome of government regulation the grimly humorous paradox of a strong Japanese industry competing with a weakened European and American one could be the outcome. Chrysler and British Leyland are already state pensioners. Need pharmaceuticals follow this route? Price and profit controls today could be the harbinger of government subsidy or ownership tomorrow.

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