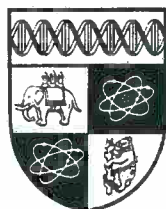


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Japanese Manufacturing Transplants: the case for regulation

Karel Williams, Colin Haslam, John Williams, Andy Adcroft and Sukhdev Johal

In arguing the case for regulating the Japanese manufacturing transplants, we are challenging the two orthodoxies which have so far shaped British and Western public response to the transplants. The two orthodoxies are the right wing economic policy discourse and the business school interpretation of Japanese manufacturing efficiency. In different ways both suggest that it is unnecessary to regulate the transplants because transplants deliver the macro and micro benefits of increased efficiency without intervention.

In the British right wing economic policy script (Dillow, 1990; Eltis, 1992) foreign manufacturing direct investment is a positive agent of economic transformation, and Japanese transplant manufacturing is the showpiece exhibit which provides the backdrop for Tory photo opportunities. The implicit message of the resulting news stories is that industrial strategy and regulation are unnecessary because if we allow the market to work it will bring us efficiency; Japanese company report pictures of happy smiling transplant workers add an extra message about happiness.

From this point of view, the government's only role is to create the appropriate framework for attracting investment by removing or resisting regulation. And this is what the British government tries to do: after Maastricht, John Major (Hansard, 13 December, 1992) defended Britain's Social Chapter opt out with the argument that it was necessary to preserve Britain's position as "the magnet for inward investment".

The business school orthodoxy reaches the same anti regulation conclusion by a rather different managerial, technicist route. The basic economic assumption is that the transplants operate at a high standard of efficiency because they apply the powerful manufacturing techniques (such as JIT and TQC) which the Japanese have invented. Thus, the MIT book (Womack, 1990) on the cars business suggested that the Japanese had invented a new system of "lean production" which could generate output with half the resources and was being spread by Japanese transplant factories.

As we have argued elsewhere (Williams et al, 1992a, 1992b), MIT proposes a managerialist politics where everything will be for the best in the best of all possible worlds provide we leave

it to the companies and accept the result of market competition between bad mass producers and good lean producers. MIT constructs a curious social world of production without politics: the only legitimate social actors are companies and their managers who can deliver the future spread of lean production provided governments and unions do not interfere.

This kind of technicism is echoed in some Chatham House publications such as the book by DeAnne Julius (1990) which argues that the old era of competitive national trade in manufactures is ending and in the new era the blocs will be connected by direct investment. Again the message is "welcome transplants don't regulate them".

The right wing policy script and the business school orthodoxy represent argument by assertion. Most of their claims and assumptions cannot be reconciled with the statistical evidence which suggests that Japanese transplant factories in Britain and America do not have desirable economic characteristics and positive results. The first half of our paper presents a range of British and American evidence on the Japanese transplants which implies that the transplants are part of the problem rather than its solution.

The second half of our paper turns from this negative work of disproof to the more positive task of reformulating the problem of the transplants so as to identify the issues, make the case for regulation and suggest the forms of regulation which would be appropriate. Broadly, we see the Japanese transplant as a special case of the more general problem of transnationals whose corporate interests do not coincide with those of the communities in which they operate.

(1) Economic characteristics of Japanese transplant factories

Radical critics of the transplants have so far concentrated on the political issue of dependence and the social issue of labour intensification. Many Japanese transplants are subvented by a variety of state incentives offered as part of the national and international competition to capture transplants: Toyota was in effect given its valuable Burnaston (Darby) site. On intensification, the Fucini (1990) book on the Mazda (Flat Rock) car plant is particularly graphic about the consequences of a system which tries to extract 60 seconds out of every worker minute.

But most radicals do not question the assumption of economic

efficiency. Thus, Garrahan and Stewart's (1992) recent book presents Nissan (Sunderland) as nasty to work for but hugely efficient. In this case the positive business school evaluation of team work is turned upside down without changing any of the orthodox assumptions about micro economic efficiency and macro economic significance.

This confusion about transplant performance arises because many economic characteristics, such as import dependence, are not directly observable by researchers, like Garrahan and Stewart, outside the transplants. From the post modernist outside it is impossible to tell the difference between a factory and a warehouse. Factories are now just like warehouses, ie blandly coloured single storey sheds without windows or smoke stacks.

From the inside what's going on is nearly as ambiguous. Manufacturing is obviously different from warehousing because in manufacturing the boxes are unpacked and their contents are processed or assembled. But the significance of manufacturing activity depends on an understanding of the whole span of span of manufacturing processes from raw materials to final assembly. There is more to manufacturing than final assembly which in cars accounts for only 15 per cent of value added.

To resolve these ambiguities, which have confused previous researchers, we have turned to the official statistics which provide an X-ray image of the economic structure and function of the Japanese transplants in Europe and America. We use the British Census of Production and the US Bureau of Commerce annual series on foreign affiliate operations in the USA to illuminate five important economic issues: size, profitability, productivity, wage levels and import dependence.

The evidence on these issues is bleakly coherent. Individual indicators, such as profitability, are ambiguous and could be explained away. Apologists must now explain why all the key indicators of behaviour and performance (including size and import content) are so uniformly unfavourable and most show no sign of improvement. The rest of us will conclude that the transplants are not up to the job of transforming economic performance because the sector is small, unproductive and heavily import dependent.

Size is not everything but, sectorally, size is a determinant of direct economic impact and indirect linkages. Numbers employed provide a crude, but intelligible, indicator of the size and weight of the Japanese transplant manufacturing sector (or TMS) and by this measure the Japanese TM Sector is negligible in both the UK and USA. In 1989 in the UK, the Japanese TMS employed 27,000 (table 2) and we estimate that it

employs no more than 50,000 in 1992. 50,000 is just over 1.0% of manufacturing employment and about 0.2% of total employment. In America as in Britain the Japanese TMS is growing rapidly from a small base but it will be a long time before this sector has any real weight. In 1989, the Japanese TMS in the US employed just 207,000 (table 3) or less than 10% of the US manufacturing workers who work for foreign owned firms.

Seldom in the history of social research has so much been written about so few. The social scientists investigating the Japanese TMS in America and Britain are researching a virtually non-existent object. These social scientists might still defend their object by arguing that the transplant factories are exemplary models of profitable and efficient production. Unfortunately this is one more assumption which cannot be reconciled with the statistical evidence on profitability and productivity.

Any review of TMS profitability is straightforward because there isn't any. As table 7 shows, America's Japanese TMS does not realise a positive return on sales. According to a 1989 JETRO survey, the position in Europe is very similar. For the British all this is nicely ironic. In the 1980's Tory politicians insisted that British managers close unprofitable mines and factories; at the same time they were welcoming Japanese managers who can not apparently make a profit.

On productivity it is important to discriminate between gross and net. Gross sales include imported components. Net output or value added excludes the imported components. In any analysis of what the Japanese TMS's are doing the relevant measure is net output or value added, because it excludes the imported components.

As the British Census shows, by the relevant value added measure of productivity the Japanese TMS does very badly. Table 8 summarises the evidence on value added per man in British manufacturing. By the value added measure, Japanese affiliates in Britain are relatively poor performers. In 1989 TMS value added per worker was roughly one-third worse than in American subsidiaries and only 15% better than in British owned manufacturing firms.

Low productivity is usually associated with low wages per head. As table 9 shows, so it is in Britain's Japanese transplant sector. In 1989 wages per worker in the Japanese TMS were around the manufacturing average for UK owned firms and 75% of the American level.

If we take this evidence at face value, the Japanese TMS hardly qualifies as a story of a new beginning. In Britain, for

example, the Japanese TMS is characterised by no profits, low productivity and low wages so that it is statistically indistinguishable from the rest of British manufacturing. How can a Japanese transplant sector with these traditionally British characteristics improve national economic performance.?

It could of course be argued that poor profit and productivity in the British and American Japanese TMS is the result of ruthless transfer pricing. If that is so, it is still cause for concern because import dependence in the TMS provides the basic precondition which allows Toyota and Matsushita to take the profit elsewhere.

What the transplants bring is, not a new standard of operating efficiency, but more tied imports. This emerges very clearly in table 12 which summarises US Bureau of Commerce evidence on import/sales ratios for wholesaling and manufacturing activities. The Japanese I/S ratio for transplant manufacturing was 26% in 1987 and 22% in 1989. This is more than twice as high as in American owned manufacturing and is half way to the import/sales ratios of 40-50 percent which are typical in foreign owned wholesale operations.

Statistically, the Japanese transplant factories in America are half way to being warehouses. Many of them are little more than warehouses with final assembly lines. Much the same point emerges indirectly and less certainly in the British Census of Production from which it is possible calculate a value added/sales ratio. As table 11 shows, in 1989 the UK's Japanese TMS had a suspiciously low VA/Sales ratio of 22%.

If the TMS are too small and mediocre to generate positive economic benefits, their import dependence creates negative costs by undermining employment. Transplant operations with a high import content create relatively little domestic employment. Value added is the fund from which wages are drawn and if the value is added in Japan the employment is created in Japan.

If that is the general logic of Japanese transplant manufacturing, in the British case it is important to distinguish between the two sectors of electronics and cars. Electronics and electrical machinery account for a third of the UK's transplant factories in 1988. Many of these factories bring manufacturing activities to the UK which would not otherwise exist. Half a job is better than none.

But the situation is completely different in cars where the one (Nissan) transplant factory in operation and the two (Honda and Toyota) under construction are designed to displace indigenous production by Ford, Rover and Vauxhall. The official EC projection is that the transplants will be producing 600,000

cars for the domestic UK market by the end of the 1990s. It is bizarre that we should send our prime minister to open factories which (at present transplant content levels) probably substitute half a job for one.

And that claim about half a job is no exaggeration because the transplant Japanese car with 80 per cent local content is a product which exists only in the press releases of Japanese car companies. The UMTRI study (McAlinden, 1990) suggests and the Bureau of Commerce statistics show conclusively that companies like Honda and Nissan are exaggerating local content. In America, the Japanese transplant car and car component factories had an import to sales ratio of 48.6 per cent in 1989.

The result is a ballooning bilateral trade deficit on cars and car parts with Japan which swells the huge British and American multilateral deficits on cars and components; in recent years, this multi lateral trade deficit accounts for no less than 40 per cent of the overall trade deficit in Britain and the United States. Thus the car transplant factories not only destroy jobs but also aggravate a trade constraint which prevents the easy reemployment of displaced workers.

(2) Transplants as a problem which requires regulation

The pattern of behaviour and performance analyzed in the first half of this paper suggests that the Japanese TMS in Britain and America is a public policy problem not a market given solution. In our view it represents a special case of the more general problem about transnational companies whose branch operations do not respect the communities in which they operate.

If this connection is not immediately obvious, that is partly because Japanese transnationals do not conform to the stereotype of TNCs as profit centred, socially irresponsible creatures prepared to re-locate to any production base where wage costs are lower. In our view, this stereotype projects the behavioral characteristics and motivations of the American multinationals onto their German and Japanese successors who are very reluctant to move away from their high wage domestic base and prefer to meet the demands of high income markets by direct export.

The existing discussion of transplants is misconceived because it focuses on the small part of Japanese manufacturing that goes overseas rather than the very large part that stays at home. The central observable point is that the Japanese majors are very reluctant to relocate anywhere outside Japan. Offshore

production in low wage Asia is just as resistible as the high income markets of North America and Europe. Japanese manufacturing employment in the rest of Asia must be tiny because the stock of Japanese MDI in Asia in 1991 was less than 1/4 the size of Japanese MDI in the USA (table 1).

The Japanese are not the leading players in a new world productive order based on FDI. Most of the outgoing Japanese direct investment is a financial flow rather than a long term productive investment in manufacturing or infrastructural development. Table 1 shows that more than 70% of the Japanese FDI stock in North America and Europe is financial not manufacturing.

There is equally no sign of any significant shift in Japanese manufacturing strategy from direct exports to overseas manufacture. As Table 4 shows, Japanese MDI outflow accounted for less than 5.0% of Japan's manufacturing exports in 1990. And that percentage is not growing steadily. Not surprisingly, Japan's trade surplus with the rest of the world is piling up not melting away. The Japanese trade surplus for 1991 was \$78 billion. And the forecast for 1992 is \$100 billion which will be a record all-time high

How do we explain the Japanese (and the German) preference for manufacturing at home? In our view the preference can be explained in terms of external conditions and internal motivations and capabilities.

The key external condition is free trade (or free enough trade) which removes or weakens the pressure to meet demand by manufacturing in the country where demand arises. In this respect, Toyota and Nissan in the 90s are differently placed from Ford and GM in the 30s who had to manufacture in Europe. The dismantling of effective trade barriers itself reflects a subtle change in political priorities. In the post-modern age consumer interests are privileged over producer interests. Voters demand a free choice of low cost, high quality consumer goods and hang the consequences for local jobs. Economics exists partly to sanction all this in an unctuous way.

Under the external condition of free trade, integration through consumption of imports displaces the internationalisation of production: overseas re-location is unnecessary because strategic markets can be supplied with direct exports from the home base. The American market is strategic to the Japanese just like North European markets to the Germans. The USA alone takes nearly 40% of Japanese manufactured exports whereas Europe takes less than 18% of Japanese manufactured exports (table 5). In many ways, the Japanese relationship to America across the Pacific is rather similar to the German relationship with the rest of Europe

within the EC.

The result is warehouses not factories. As everybody knows, the German owned sheds in Swindon and Milton Keynes are warehouses and not factories. And the Bureau of Commerce shows much the same is true of Japanese sheds in L.A and Detroit. As table 6 shows, in 1989 Japanese wholesale affiliates in the United States had a turnover which was 5 times larger than the sales turnover of the transplant manufacturing operations. Transplant manufacturing sales are of course increasing faster and help to swell wholesale sales. Nevertheless, the increase in wholesale sales between 1987 and 1989 is greater than the absolute level of manufacturing sales in 1989.

If external conditions allow this pattern of development, the change in external conditions only becomes crucial with the rise of new German and Japanese MNCs whose internal motivations and capabilities are different from those of their American precursors. The Japanese and German preference for direct export from home base is determined by national calculations of social responsibility and private advantage.

In terms of corporate social responsibility, manufacturing at home safeguards domestic MVA and thus domestic employment in countries whose national economic and social settlements are underwritten by manufacturing exports. The Japanese economic settlement combines high rates of productivity growth with job security for a minority of workers in major companies. As table 13 shows, the circle is squared by rapid output growth. And the circle must be squared because, in the absence of a proper welfare state, there is no buffer for unemployment.

The obligations of corporate social responsibility are reinforced by private calculations of economic advantage. And we can illustrate the private economic advantage by considering the case of the Japanese car industry. The basic point is that the Japanese car industry's margin of advantage over its competitors is much narrower than most business school academics admit. And this narrow advantage rests on a complex combination of superior techniques and specific national conditions which allow long working hours and a steep wage gradient between assemblers and suppliers.

The business school myth about Japan's post-Fordist efficiency credits all or most Japanese companies with a productive capability that none of their Western counterparts equal. But the statistics tell a different story. Sectorally, the Japanese motor industry has been on a long trajectory of taking labour out, but in the aggregate they have not achieved anything like the 2:1 superiority that MIT asserts. The US motor industry

takes 145-175 hours to fully manufacture a vehicle; the Japanese industry takes around 135 hours (table 16).

If we disaggregate performance and look at companies, then Toyota stands out in our own time as a unique high flow manufacturing company just like Ford (Highland Park) 80 years ago. If Toyota leads the world, that's not true of other Japanese like Nissan, Honda and Mazda which add less value per man than Ford (US), GM and Chrysler (table 14). On most measures the European industry lags behind the Americans, but if we exclude component suppliers and just compare assemblers, then there too the margin of physical advantage is less than overwhelming.

The Japanese assembler performance in terms of cars per man is biased upwards by vertical disintegration and a shorter span of operations. Japanese firms build less of each car. Toyota has a value added/sales ratio of less than 15 per cent and actually subcontracts the assembly of nearly half its output. The German assemblers have value added/sales ratios of 35 per cent. Within a given span of operations a significant part of the Japanese physical advantage arises from longer hours not techniques. Bosch (1992) and Lehndorff's (1992) research shows that in 1990 Toyota and Nissan assembly workers worked 2,300 hours against an European average of 1750 hours and nearer 1600 hours in Germany.

Because the Japanese margin of physical superiority in the assembly factory is a narrow one, the question of wage rates is very important. And here the Japanese magnify their advantage by drawing most of the value of their output from a component sector where there is an unusually steep wage gradient. Table 15 demonstrates this by comparing value added distribution and wage gradient by size of firm in the Japanese and British motor industries. In the Japanese industry 26.5 per cent of the workforce works in establishments employing less than 100 and paying wages roughly half those in the large assemblers.

The case of cars snaps the argument for regulation into focus and suggests the forms of regulation which would be appropriate.

The case for regulating Japanese access to the European and American markets is a straightforward one. The competitive advantage of the Japanese stems partly from technical superiority and partly from social differences about acceptable hours and wage gradient. If those of us with European values prefer the German system, then it is reasonable to restrict market access and safeguard producer welfare at a modest cost in terms of more expensive cars.

The form of regulation is again straightforward, given the nature of the problem about imported components. The ballooning

American deficit on Japanese parts and components shows Europe what will happen under the current EC style regulation which is focused on finished imports and transplant numbers. Effective regulation would have to focus on parts imports.

Meanwhile, some American style hard information about import content would be an useful step forward for Europe. Under the bizarre voluntary system operated by Nissan (Sunderland) everything which is purchased in Europe counts as European content even where the road from the supplier factory runs back to the port and the containers from Yokohama.

Of course, the problem of the Japanese transplants is part of a larger problem about non Japanese transnationals whose operations within Europe and America can have the same economic effect; economically and socially, the Peugeot-Talbot assembly operation at Ruyton is indistinguishable from the Nissan operation at Sunderland. However, the possibility of regulating the French firm in Britain has been undermined by European economic integration and its supporting ideology of free trade and hang the consequences for the local community.

Because the consequences are the same whatever the nationality of the irresponsible TNC, it is intellectually important to set the Japanese case in a broader context. But, politically, the priority must be to press the case for regulating Japanese transnationals at a supra-national level in Europe and a national level in the USA because an unfocused and ineffective regime of trade regulation on Japanese imports already exists at this level. Like Leninist revolutionaries, those who support trade regulation must find the weakest link.

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Table 1: Cumulative total of Japanese FDI 1970-91

	Manufacturing		Non-manufacturing		Total
	US \$ mill	Mfg %	US \$ mill	Non-Mfg %	US \$ mill
Pacific Rim					
Asia	18,562	40	28,008	60	46,570
North America	40,243	30	94,182	70	134,425
Latin America	5,256	13	3,411	87	39,368
Rest of World					
Europe	12,519	22	44,378	78	56,897
Residual	4,997	19	21,827	81	26,823

Source: JETRO (Japanese Ministry of Finance)

Table 2: Foreign affiliate share of UK manufacturing (Div. 2-4) employment

Nationality	1983		1989	
	Nos.000s employed	% of total	Nos.000s employed	% of total
UK owned	4,343.8	85.5	4,149.5	85.1
EC 11 affiliates	108.5	2.1	133.5	2.7
French affiliates	31.3	0.6	41.2	0.8
German affiliates	24.0	0.5	24.6	0.5
US affilites	458.5	7.7	395.0	8.1
Japanese affiliates	3.7	neg.	27.2	0.6

Source: PA 1002, UK Census of Production, table 18, 1983 and 1989.

Table 3: Foreign affiliate shares of US employment

	Manufacturing		Other	
	Nos.000s employed	% of total	Nos.000s employed	% of total
Japanese affiliates				
1978	27.7	3.4	62.8	9.9
1984	64.8	4.7	125.0	9.4
1989	207.5	7.9	296.8	16.4
EC 12 affiliates				
1978	616.7	76.7	405.4	64.7
1984	885.7	64.1	849.9	63.7
1989	1442.3	54.7	1293.4	71.6
Rest of World affiliates				
1978	159.5	19.8	158.7	25.3
1984	431.0	31.1	357.9	26.8
1989	985.9	37.3	214.2	11.9

Source: Foreign Direct Investment in the USA, 1978, 1984, 1991.

Table 4: Japanese MDI as percent of Japanese manufactured exports

	N. America	Europe
1984	3.7	1.7
1985	1.7	1.7
1986	1.4	1.1
1987	5.5	2.2
1988	9.7	3.3
1989	4.9	3.2

Sources: OECD, 1990 and 1991; JETRO (Ministry of Finance)

Table 5: Japanese exports of manufactured goods to the USA and Europe as per cent of total manufactured exports

	Total exports US \$ bill.	Exports to USA		Exports to Europe	
		US \$ bill.	% of total	US \$ bill.	% of total
1984	165.0	63.6	38.5	19.7	11.9
1985	170.6	69.2	40.6	20.4	11.9
1986	203.5	85.3	41.9	30.3	14.9
1987	222.9	88.3	39.6	37.25	16.7
1988	257.1	94.6	36.8	46.2	17.8
1989	266.6	96.1	36.1	47.12	17.7

Source: OECD 1991.

Table 6: Foreign affiliate sales in USA by sector in US \$ millions

	Manufactur ing	Wholesale	Financial Services	Other
Japanese owned				
1987	14,006	150,037	11,228	7,056
1988	24,750	174,816	16,614	9,136
1989	39,262	192,930	21,171	13,677
EC 12 owned				
1987	116,083	88,923	7,467	112,469
1988	143,683	95,091	13,606	118,018
1989	181,112	105,740	10,399	149,263

Source: US Department of Commerce, various years.

Table 7: Sales and profits of foreign manufacturing affiliates based in USA

	Sales US \$ mill.	Net Income US \$ mill.	Profit as % of sales
Japanese owned			
1978	2,621	3	0.11
1984	9,914	25	0.25
1989	39,262	-460	-1.17
EC 12 owned			
1978	46,482	1,473	3.17
1984	105,812	2,117	2.0
1989	181,112	3,142	1.73

Source: US Department of Commerce, Foreign Direct Investment in the United States, 1978, 1984, 1991.

Table 8: Relative value added per head of UK owned manufacturing firms and UK based foreign manufacturing (divs 2-4) affiliates

	Value added per cap. £000s nominal		Relative value added per cap. v. USA as 100	
	1983	1989	1983	1989
UK owned	12,947	20,149	72.3	58.9
EC 11 affiliates	14,331	26,148	80.0	76.6
French affiliates	12,073	30,524	67.4	89.4
German affiliates	16,035	27,750	89.6	81.2
US affiliates	17,906	34,153	100.0	100.0
Japanese affils.	13,880	23,523	77.5	68.8

Source: PA 1002, Census of Production, Table 18, 1983 and 1989

Table 9: Wages and salaries per head of UK owned manufacturing firms and UK based foreign manufacturing affiliates (divs 2-4)

	Wages/salaries per cap.		Index relative to US owned affiliates	
	1983	1989	1983	1989
UK owned	6,892	10,771	81.8	76.1
EC 11 affiliates	7,963	12,644	94.5	89.3
French affiliates	8,246	13,815	97.9	97.6
German affiliates	7,542	12,597	89.5	89.0
US affiliates	8,426	14,154	100.0	100.0
Japanese affiliates	6,135	10,955	72.8	77.3

Source: PA 1002, Census of Production, Table 18, 1983 and 1989

Table 10: Japanese TMS share of 1989 sales and employment in all US based foreign-owned manufacturing affiliates

	Japanese sales as % of total	Japanese employment as % of total
1987	6.3	5.3
1988	9.2	8.7
1989	11.3	7.9
1987-9 average	8.9	7.3

Source: US Department of Commerce, various years.

Table 11: Value added as per cent of sales in UK owned manufacturing firms and UK based manufacturing affiliates (divs 2-4)

	1983 VA/sales as %	1989 VA/sales as %
UK owned	35.8	35.0
EC 11 affiliates	28.9	28.9
French affiliates	32.6	30.4
German affiliates	37.4	32.1
US affiliates	32.1	31.5
Japanese affiliates	25.9	21.6

Source: PA 1002, Census of Production, Table 18, 1983, 1989.

Table 12: Import/sales ratios by sector for US based foreign affiliates

	Manufacture	Wholesale	Other
Japanese affiliates			
1987	26.1	44.8	neg.
1988	20.8	40.3	neg.
1989	21.7	38.3	neg.
German affiliates			
1987	13.3	55.3	neg.
1988	14.9	43.6	neg.
1989	13.9	39.5	neg.
Dutch affiliates			
1987	9.7	10.8	7.0
1988	12.5	n/a	5.0
1989	13.3	n/a	8.2
UK affiliates			
1987	7.4	11.9	6.4
1988	7.8	12.9	5.0
1989	6.1	13.3	12.5

Source: US Department of Commerce, various years.

Table 13: Index of Japanese manufacturing output and employment

	Manufacturing output index 1979 = 100	Manufacturing employment index 1979 = 100
1979	100.0	100.0
1983	108.3	106.1
1987	127.1	109.8
1990	154.2	118.0

Source: UN Industrial Statistics Yearbook, various years.
International Labour Office Statistics, various years

Table 14: Japanese and US sectoral and company value added productivity per employee.

		1987 \$ US
Japan	Transport equipment sector	82429
America	Transport equipment sector	77751
Companies	Nissan	63099
	Toyota	98753
	Chrysler	62158
	Ford US	77398

Sources: Datastream; United Nations, Industrial Statistics Yearbook, 1988; Company Accounts.

Notes: Calculations assume the Yen to \$ US exchange rate is Yen 123.5 to the \$ US.

Wage costs for Japanese firms are estimated using wage per employee data from the 1987 Nissan Corporate Profile which gives company labour costs for each year from 1986 to 1990.

Table 15: Wage gradient by size of firm in the Japanese and UK automotive sectors in 1989

Japan					
Size of firm	Wage gradient top to bottom	Share of sectoral VA	Share of sectoral employment	VA/purchases ratio	Purchases/sales ratio
1-99	56.4	15.1	26.5	68.3	58.0
100-199	68.2	5.7	8.5	44.9	66.8
200-499	76.6	9.7	11.8	43.3	67.6
500-999	86.2	11.1	12.6	45.5	66.8
1000+	100.0	58.4	40.6	33.1	70.4

Source: Japan Statistical Yearbook, various years.

UK					
Size of firm	Wage gradient top to bottom	Share of sectoral VA	Share of sectoral employment	VA/purchases ratio	Purchases/sales ratio
1-99	78.3	5.6	9.2	66.9	59.9
100-199	74.7	3.2	4.9	72.8	57.8
200-499	79.5	6.1	8.6	57.9	63.3
500-999	79.6	6.3	8.8	68.5	59.3
1000+	100.0	78.7	68.5	44.6	77.1

Table 16: Build hours per vehicle in Japan and the USA, 1969-88

Japan				
	Employee Nos. 000s	Vehicle output per employee	Hours per employee	Hours per unit of output
1969	561	8.33	2,330	279
1972	607	10.37	2,304	222
1975	601	11.55	2,033	176
1978	638	14.53	2,127	146
1981	700	15.97	2,200	138
1984	722	15.78	2,220	141
1987	742	16.51	2,179	132
1988	742	17.12	2,257	132

United States				
	Employee Nos. 000s	Vehicle output per employee	Hours per employee	Hours per unit of output
1969	882	11.54	1800	156.5
1972	916	12.34	1800	146.3
1975	807	11.14	1800	162.2
1978	1061	12.09	1800	148.7
1981	791	10.09	1800	178.2
1984	865	12.63	1800	142.8
1987	944	11.62	1800	154.8
1988	921	11.95	1800	150.6

Sources: United Nations, Industrial Statistics Yearbook, various years; International Labour Office, Labour Statistics Year Book, various years; OECD, Industrial Structure Statistics, 1989.