

Future of the Automobile Program

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US-A-81-2-0

February 1981

THE DECLINE OF THE AMERICAN AUTO
INDUSTRY AND THE SEARCH FOR
INDUSTRIAL POLICY

by

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Background Paper
International Policy Forum
Eagle Lodge, Pennsylvania, U.S.A.

28 June - 1 July, 1981

Massachusetts Institute of Technology
Center for Transportation Studies

For Internal Auto Program Distribution
Not for Citation, Quotation or Publication

INTRODUCTION

The precipitate decline of a major industry presents problems for any government but the collapse of the auto industry in America raises very special problems: Autos have been America's "industry of industries" during most of the twentieth century and America has uniquely lacked an industrial policy addressed to the problem of declining sectors. Thus the crisis in Detroit is a grave threat to the whole economy which brings in tow a crisis in American thinking about government's role in the market economy.

This paper is an effort to think systematically about the problem of industrial policy for declining sectors by reference to the case of the auto industry. The task is organized in two parts. The first is an analysis of the forces guiding the evolution of the industry and leading to the present situation. The second is a review of the options for fashioning an industrial policy appropriate for the circumstances of the 1980's.

PART I. ANALYZING DETROIT'S MALAISE

The most prominent explanation for the decline in the preeminence of Detroit derives from the work of Raymond Vernon in the 1960's [1]. It posits an adverse turn in the product cycle in which the auto industry has become broadly uncompetitive with foreign producers just at the time the domestic auto market has reached saturation. And certainly, the arrival of the fourth stage of Vernon's produce cycle, characterized by growing exports back to the home market from areas where the industry has developed relatively recently, does describe much of the current situation.

However, product cycle theory scarcely helps to explain why the fourth

stage should arrive now. Nor does it incorporate two additional factors in the current situation -- the emergence of independent foreign competition and the development of national industrial policies for the auto sector in Japan and Europe -- which seem central to recent events. Thus it appears that explanations are required which go beyond the operations of the product cycle under conditions of competitive capitalism. In order to develop these we need to begin with a review of product cycle and international trade theory.

The Economics of International Trade and the Product Cycle

The evolution of economic thought about international trade has involved a progressive relaxation of classical assumptions in order to produce a theory congruent with on-going reality. The classical formulation of Heckscher and Olin in the 1930's could as well have come from Adam Smith: In a world of static products and competitive producers the key to the level and direction of trade in manufactured products lies in differing factor costs (corrected, of course, for the trade damping effects of tariffs and transportation costs). Countries with cheap labor export labor intensive products, countries with cheap energy export energy intensive products, and so on. The problem with the comparative advantage approach was that its elegance and simplicity were inversely related to its explanatory power. Wassily Leontief, in a famous article in the early 1950's [2], reported that the U.S., with the world's most expensive labor, was the leading exporter of some of the world's most labor intensive products -- commercial aircraft, for example, which are effectively hand made -- and that on balance American exports were as labor intensive as American imports. Once the sanctity of the Heckscher-Olin paradigm was breached, other empirical investigators in the 1950s quickly piled anomaly on top of anomaly.

Raymond Vernon, on pondering the faults of comparative advantage theory in the early 1960s, focused on the assumption of a static product. In a

world of rapid technical advance this seemed a particularly doubtful premise and Vernon was able to present impressive evidence in a seminal article [3] that products invented in and exported from one country might eventually be exclusively manufactured in and imported back from a second country without any change in comparative factor costs between the two countries. Vernon explained this phenomenon in terms of a "product cycle" with four phases [4]:

Phase I: Product/Process Invention and Production for the Home Market

The initial phase of the cycle is triggered when special conditions in one country give rise to the creation of a new product or industrial process. In the U.S. historically the circumstances yielding new products and processes have been the relatively low cost of raw materials and energy, the relatively high cost and scarcity of skilled labor, the high level of per capita income (creating demand for new consumer products), and the enormous size of the domestic market. Thus American entrepreneurs have had strong incentives to discover new ways of producing consumer goods which require little skilled labor, even if relatively wasteful of materials and energy, and which lend themselves to scale economies of production for the mass market. And, in the initial phase of product development, characterized by continuous adjustment of product attributes based on experience in the market place, location of manufacturing close to the point of sale has proved more important than a location with the lowest factor costs. This is because demand for the product is typically price inelastic (most "new" manufactured products find their initial success as luxury goods) but highly sensitive to product attributes and performance. Near-by location, of course, reduces communication costs and response time in fine-tuning the product.

Phase II: Saturation of the Home Market and the Search for Export Markets

As the manufacturers in a new industry began to perceive the limits of the home market they naturally look for foreign markets. Their urgency in the search will depend on the nature of home market saturation since for many manufacturers there will be perplexing choices between further elaboration of the product in the home market¹ and a push for sales abroad. The latter course will be particularly attractive for firms intent on price competition in the home market since additional production for export will often reduce average costs.

Phase III: Production of the Product in Foreign Markets

At the beginning of export sales the domestic manufacturers will generally have a price or quality advantage in foreign markets by virtue of the favorable circumstances which led to invention of the product in the home market. However, as time passes, the product becomes more uniform ("commoditized"), and the volume of exports increases, domestic exporters may find foreign manufacture of the product increasingly attractive for several reasons.

First, competitors (including other manufacturers from the country where the product originated) may appear and shift the terms of competition from product quality to price. This may encourage the original producer to reduce transport, labor, and other factor costs, or to escape tariff discrimination, by setting up shop in the "host" country. Second,

¹Product elaboration might involve a number of techniques. For autos these have included annual model changes designed to speed turnover, a proliferation of product types for -- in the words of Alfred Sloan -- "every purse and purpose": pickups, vans, sports models, compacts, super luxury models, etc., and an endless variety of options extended recently to include fuel economy add-ons such as turbo-charging, five speed gearing and "lockup" torque convertors. In some cases, and autos seem to be an example, the potential for elaboration is so great that market saturation may be delayed for a very long time.

the volume of product imports may exceed the host country's ability to finance through exports with the result that local manufacture is essential to increased sales. Third, host governments or local capitalists may desire to promote local industry by requiring substantial local content in the exporter's product.

In any or all of these cases the decision by one of the originating manufacturers to establish foreign manufacturing facilities will often cause its home country competitors to do likewise. The alternative will usually be to forfeit the foreign market in question since a firm initiating host country production will generally request and receive generous tariff or local content requirement protection.

Phase IV: Export of the Product from Foreign Manufacturing Sites Back into the Home Market

Again, as time passes -- and as the advantages of the initial producers such as patents, other specialized knowledge, and physical proximity to a rapidly changing consumer market, begin to fade -- foreign manufacturers may develop products or production processes comparable or even superior to those of the original manufacturers. And, because of lower labor or other factor costs, it may be possible for these manufacturers to export back into the home market. (In other words, for fully developed, "commoditized" products where competition is primarily on price the logic of the Heckscher-Olin comparative advantage model reasserts itself. The analytic virtue of the product cycle model is therefore seen to lie in its ability to explain why "younger" products behave differently. The adjustment it provides to the predictions of the H-O model is more or less proportional to the pace of technical change.)

Phase IV generally develops after the home market has reached a

saturated, "replacement only" stage and is therefore particularly ominous for the original producers since import sales occur at their direct expense. Original producers fearing the onset of phase IV have a choice between market strategies (diversification out of the product line, further elaboration of the product so as to effectively restart the product cycle, a move to offshore sourcing, etc.) and political counter measures coaxed from home governments (tariffs, local content regulations, fiscal stimulation to increase the total size of the market to be divided, and a host of others to be considered in a moment.) The former are doubtless more attractive to producers since they can be accomplished without political entanglements but they are also generally less feasible due to the giant scale and low levels of innovation in most oligopolistic industries approaching phase IV.

The incorporation of the product cycle initially seemed to greatly improve the predictive capability of the comparative advantage model but as investigators applied the hybrid model to a broader range of industries anomalies again emerged. By the mid-1970s Vernon and others [5] were reporting that phase IV seemed never to arrive in some industries no matter how "mature" the product and that it arrived very quickly, in fact almost instantaneously, in others. They concluded that in addition to factor costs and the maturity of the product, analysis of trade must focus on the multinational structure of industrial sectors. In general they found that in highly competitive sectors containing multinational corporations (e.g., electronics) the product cycle was likely to proceed very rapidly with even initial production of "new" products (e.g., videodisks) concentrated in low factor cost countries. By contrast, in sectors with tight multinational oligopolies (such, for example, as the world auto industry up through the late 1960s) the cycle might even be permanently arrested.

Vernon explained the latter phenomenon in the following terms [6]: A

member of a multinational oligopoly which is not threatened with independent competition is hardly likely to move production to the most favorable factor-cost location for export back to the home market (i.e., to usher in phase IV), and for three reasons:

(1) Any move of this nature exposes the producer to foreign political risks since the foreign governments will typically not be so receptive as the home government to manufacturer entreaties, or, if it is as receptive, the foreign government will be more subject to overthrow and the producer's property more subject to expropriation.

(2) Any move abroad exposes the producer to home country political risks stemming from the loss of jobs and the negative consequences for the trade balance.

(3) It is all pointless anyway since the oligopoly as a whole is unlikely to be concerned about consumer prices (unless dealing in a product felt to be extremely price elastic), since the price-leader (in the case of an American firm) probably cannot afford to increase its market share substantially for fear of anti-trust action, and since the price-followers know that any success in price competition due to an offshore move will be quickly nullified by a similar move by the price leader.

Thus an industry dominated by multinational oligopolists will proceed to phase III but then arrest the cycle subject to an independent threat.

The Politics of International Trade and the Product Cycle

The Heckscher-Olin model of world trade modified to take account of the product cycle would prove highly predictive of the direction and volume of trade in a world of perfectly liberal governments (i.e., no trade barriers), widely varying factor costs, and competitive industries. The progression of industrial sectors through the phases of the cycle, ending in the drift of production off-shore to low labor cost areas, would occur without interference from governments, and political analysis would add little to an understanding of world

industrial development. However, even the most casual observation indicates that the actions of nation states significantly alter the workings of the product cycle and that state action is, in turn, the outcome of a continuing struggle between factions within societies whose interests are best served by facilitating the cycle, or retarding it, or even eliminating it altogether.

The objectives of the parties involved in product cycle policy debates are the key to political analysis and are therefore of central interest here. We may begin by examining the objectives of manufacturers whose need for actions outside of the market context -- which we will label "political action" and which consists of entreaties to home country governments for various sorts of assistance--will vary in degree and nature with the phases of the product cycle.

In the invention phase political action by manufacturers will generally be minimal both for lack of need and for lack of leverage by small industries to compel responses from the state. The key exception will be products or processes with clear military applications but a limited consumer market in the absence of assistance from the state with research, development and initial production. Producers of such products will often find it worth their while to lobby for defense contracts which will increase the volume of production runs, reduce costs, and make the product more attractive to private consumers.²

Producers entering the second or export phase of the product cycle will invariably develop a passionate belief in free trade. Because their products are by definition of higher quality and/or lower price than those of foreign competitors (if any) home manufacturers have nothing to fear from reduction of domestic tariffs. And, they may have much to gain for two reasons. First, domestic tariff reductions may be bartered for foreign tariff reductions

²This activity, it bears note, is only marginally "political" in that government is the initial consumer, a very different sort of activity from use of government power to alter market structures, exclude foreign competition, subsidize products not needed by government, and so forth.

permitting greater sales volume for domestic products in foreign markets. Second, even if foreign tariffs do not decline to the same degree as domestic tariffs (as has been the case when Britain in the 19th century and the U.S. after World War II pursued free trade policies) producers of dominant products will still benefit to the extent that absorption of imports in other sectors by the home market stimulates foreign economies.³ Thus, in general, one will find a nation's phase II industries behind the most vigorous lobbying activities for reduced tariffs.

Industries in the third or foreign production phase of the product cycle will generally find their need for government assistance focused on favorable tax treatments for foreign investments, liberal rules on export of capital, and, as their investments in other countries become substantial, diplomatic or military initiatives to maintain political stability and protect investments. A domestic free trade policy will continue to stir passions in the hearts of producers and for the same reason as in phase II in that absorption of imports by the home market will spur the growth of foreign markets. The ardor for free trade will generally cool at the home country border, however, since producers may find great advantage in demanding high tariff walls in the host country for establishing manufacturing. (They will argue that in the host country they are effectively "infant" industries.) Tariff protection will be particularly important if the foreign market is too small to permit full economics of the scale and is therefore vulnerable to imports produced elsewhere at higher volume.

The fourth phase of the product cycle presents a very serious problem for declining producers who are suddenly highly vulnerable to imports from countries with developing industries. James Kurth [7] cites three forms of government assistance commonly sought by phase IV producers:

³The theory here is that a booming foreign economy will increase its level of imports even over a high tariff compared with a stagnant foreign economy which can find no outlet for its exports.

- 1) Additional government-induced demand creation (perhaps including credit preferences) to enlarge the domestic market for the product, leaving room for domestic and foreign producers.
- 2) Government assistance in restraint or reduction of real wages and benefits in order to increase profits. This will increase the amount of capital available for reinvestment in research and production facilities so as to make producers more competitive in world markets.
- 3) Abandonment of free trade to be replaced either with international production cartels or protective tariffs in the homemarket.

To these might be added three more approaches:

- 4) Government assistance with research and development subsidies, investment tax credits, or restructuring of the "social cost" burden through such techniques as value-added taxes,⁴ to give domestic producers technological and cost advantages in world markets.⁵
- 5) As an alternative to 4), elimination of government product and production process regulation to permit producer cost savings and higher profits which, as in 2) above, can be plowed into research and new production facilities to make domestic producers more competitive.
- 6) Additional government assistance with foreign investment opportunities, particularly in the form of severance allowances and job training for displaced workers, so that lagging domestic producers can move more of their operations abroad to take advantage of

⁴The contention of phase IV producers will be that social welfare costs (social security, unemployment compensation, medical benefits, occupational health and safety programs, and externality costs such as pollution control equipment) are higher in the home country than for foreign producers. Thus these should be financed with value added taxes applied both to domestic and imported products rather than from employer/producer contributions.

⁵In practice these measures will generally function as negative tariffs, as foreign producers will be quick to point out. However, the case will be much tougher to prove than for more direct means of restricting imports and this feature enhances the attraction of this approach for domestic producers.

favorable factor costs while exporting off-shore production back into the home market. (This approach is, of course, consistent with and in fact completely dependent upon continuation of free trade.)

The objective of these measures is either to increase the cost of foreign products, to decrease the cost of domestically produced products, to restore the technical/quality edge of domestic producers or to help them escape to greener pastures.

So far we have considered only the perspective of producers and their most likely political recourse at various stages of the product cycle. However, other groups will also find the powers of the state useful for steering the behavior of producers. Candidates for countervailing political action will include competitors; other industrial sectors; the bankers, suppliers and dealers tied to a producer or a sector; employees and their unions; foreign governments and their client industries (who, as the Koreans have recently illustrated, can play the Washington lobbying game just as vigorously as the domestic contestants); groups which may be generically labeled the "guardians of externalities" (e.g. Naderites); and even the state itself and its bureaucracy.⁶ As with producers, the activities of these groups are predictable within a broad range at various stages of the product cycle.

In the first phase the major political issue is likely to be the oligopolization or monopolization of an industrial sector as scale economies edge out all but a few of the original producers. The protests arise from small producers facing extinction as well as from retailers and suppliers who find

⁶ The proposition that the state bureaucracy itself plays an independent role in trade and industrial policy (rather than simply implementing the policy of the victorious faction in the policy debate) is most often suggested by observers of the French and Japanese political systems. In France and Japan, where a centralized bureaucracy is deeply entrenched, government has seemed most powerful and independent in the immediate post war period when industry was very weak. In America, by contrast, where a central bureaucracy has emerged only recently and where industry is (or at least used to be) thriving, the analytic case for an independent government role is much more dubious and will be considered only in passing here.

the concentrated power of the major producers a threat to their independence. In the case of the American auto industry, for example, Federal Trade Commission and Congressional investigations over the years seem to have been prompted by cries of anguish from losers in the oligopolization process rather than from any widespread public demand for action. And, once the losers in these contests had lost, the issue disappeared.

More salient disputes concerning government policy towards an industry generally commence with the third or overseas production phase of the product cycle and intensify in the fourth stage. The actors in the drama are the industry and its unions and the issue is invariably the "export" of jobs.

While the self-interest and probable political actions of the groups involved in the policy process are relatively easy to predict, the net result of the pushing and shoving of many interests is much more difficult to calculate. This is particularly so because industrial sectors and their unions are likely to be the most powerful voices in the debate, but are also likely to spread out over time along the product cycle. [8]

As a country begins industrialization, with most industries in their infancy, a united front for protectionism and government financial assistance is highly probable. Similarly, in a period of national decline when most industries are no longer competitive in world markets, protectionism and other forms of government aid to industry are to be expected. However, at points in between, when some new sectors are still emerging, many others are in phases II and III and the rest are in decline, the outcome is much less certain. Indeed, the one constant in such periods will be the intensity of conflict over trade policy, which will always be sharp because of the near impossibility of protecting declining sectors without provoking retaliation in foreign markets against leading sectors.

When one adds the additional complexity that the political strength of industrial sectors will vary with such factors as the size and geographic

distribution of their labor force and retailer network as well as the relations between a sector and its bankers (who may also finance other sectors with very different political needs) the power of the product cycle model to predict specific events as opposed to broad trends must be rather modest. The rest, as they say, is history.

In the next section we will review the history of the American auto industry to see how much the product cycle model explains and to identify factors which may account for the "variance" between the general predictions of the model and the actual course of events.

The American Auto Industry and the Product Cycle

Phase I: Perfecting the Product and the Production Process

The auto as a workable apparatus was developed in Germany by Gottlieb Daimler and Karl Benz about 1885 but the modern auto industry, with its mass produced, low-price product, came into being in Highland Park, Michigan in 1914. At that point a vehicle type (the Model T) was combined with a production process (the moving assembly line using minimal skilled labor) and a labor relations pattern (relatively high wages coupled with extreme regimentation)⁷ to create the auto industrial system which has changed hardly at all in the intervening 65 years.

Prior to the breakthrough at Ford's Highland Park plant the auto industry had been primarily a low volume, high price enterprise producing a customized luxury product for the well to do, particularly for substantial professionals such as doctors with a business use for the vehicle. Manufacturers were more properly termed "assemblers" since they bought parts from suppliers (mostly wagon and bicycle makers, the industries from whence most early auto makers came), assembled them and sold the vehicles to retailers.

⁷ The Model T was actually introduced in 1908. The production technology and the labor relations model which completed the system were introduced together in 1914.

The financing of the assembly operation was remarkable in that none was generally necessary - by the time the bill for the components came due the cash was in hand from the retailer - and it is hardly surprising that many followed Ford into the business, more than 250 in fact by 1908. [9]

Since the initial development of the Otto cycle engine and the prototype vehicle had occurred in Europe it is not surprising that European companies were active in the U.S. from the beginning. In 1905 imports had about 4 percent of the market but foreign influence declined very rapidly to less than 1 percent by 1909 (a level not surpassed until 1955). The reasons, and they constantly recur in the history of automobility, were in part the tariff (45% on fully assembled vehicles) but more significantly a divergence in national auto markets.

The European auto was designed for a largely upper class, leisure market, which was hardly surprising given the income distribution and the degree of urbanization. Furthermore, specifications were adjusted to meet a secondary military use. In fact, those agreeing to purchase vehicles meeting military specifications could practically achieve a free ride: the German, French and English governments each paid large "mobilization" subsidies for vehicles earmarked for possible military use. As James Flink notes, the effect "...was to discourage the manufacture of light cars in Europe in favor of heavier touring cars...that would be better suited for use as officers' staff cars..." [10] A few European manufacturers did attempt to jump the American tariff wall by manufacturing in the U.S. -- Daimler-Benz between 1905 and 1913 and Fiat between 1909 and 1918 [11] -- but the luxury end of the market was shrinking rather than expanding and they could develop no comparative advantage. Other European manufacturers developed a vehicle for the mass market in the form of the motorized bicycle but these proved to have limited sales appeal in America: they were largely worthless on unsurfaced roads.

Henry Ford and other auto entrepreneurs were also worried about roads but failed in their initial foray into politics, the Brownlow-Latimer Federal Goods Roads Bill. The measure, which would have involved the Federal government in a program of rural highway construction, died in committee in 1903 and went no further until well after the auto was in mass production. [12] Ford concluded that in the absence of a roads program a vehicle was needed which could operate dependably in the mud. In addition, it should be producible with a minimum of skilled labor (which was expensive in America), should be easy to repair (since there was no service network), and should be priced to tap the mass market of farmers with moderate incomes and poor road access. The size of this market would in turn justify a capital intensive production process.

The Model T precisely met this need with its high undercarriage (to avoid sticking in the mud), its vanadium steel frame (to stand up to rough surfaces while greatly reducing weight, again to avoid getting stuck), and its low price. It quickly swept aside the motorized buggy -- essentially a light horse-carriage equipped with a motor which had been the American equivalent of the European motorized bicycle -- and captured the entire low price end of the market.

As Model T sales soared Ford was able to generate financing internally to open a new plant in Highland Park in 1910 and to equip it with a continuous assembly line by 1914. As a result of the new technology he could turn the unheard of trick of reducing prices drastically (from \$850 in 1908 to \$290 by 1922) while doubling wages (to the famous 8 hour, 5 dollar day in 1914.)⁸ The effect on industry structure was predictable -- only those firms with the capital to duplicate Ford's technology could survive and in practice

⁸The \$5 day helped Ford in two ways. It greatly reduced turnover which had been as much as 60 percent per month, thereby reducing training costs and boosting output per employee. And it drove up wage rates at Ford's competitors whose production techniques were much more labor intensive.

only one did. By 1923 Ford and General Motors had 71 percent of the car market even though seventy producers were still in the business. Chrysler was able to gain a foothold in 1927 when Ford closed for 9 months to re-tool for the Model A, but otherwise the point of entry into the industry had passed.⁹

With the development of the all-steel body and annual styling changes in the late 1920's (both of which greatly increased tooling costs) and the mass production of even luxury models, practically all of the independents were eliminated. Finally, with the careful differentiation of models over a wide price range (as perfected by Alfred Sloan at GM and reluctantly copied by Ford) the mature auto market with its familiar oligopolist members was at hand by 1929.

Three additional features of the mature auto-industrial system are worthy of note. The first is the exclusive dealer franchises originated by Ford and copied by GM and Chrysler. Under this arrangement dealers agreed to handle only one maker's products and were in turn given what amounted to a monopoly on a territory. From the manufacturer's standpoint the system was attractive because it reduced the number of dealers to manage (compared with a free entry system) and because, by increasing the size of dealerships, it was thought to reduce dealer overhead costs and auto selling prices.

However, the system had one flaw from the manufacturers standpoint, which was that dealers with a monopoly on a territory generally found it in their interest to sell fewer cars at higher markups than the volume which would maximize manufacturer profits. Thus was born the "forcing" system whereby manufacturers set quotas for dealers' factory orders to be enforced in the

⁹ Kaiser-Frazer (1947-1955) made the last serious effort to break in using technology identical to that of the big three. Several entrants are in the wings today but with radically different technologies. These were developed with government grants or subsidies (in the case of Mini cars) or are being produced with government loans (in the case of DeLorean.) It is possible, although very unlikely, that the recent shift in the environment (energy costs and broader technical change) may be great enough for these new producers to succeed.

extreme by cancellation of the franchise. Since the manufacturers also quickly discovered that surges in demand and cash flow problems could be alleviated by forcing vehicles on the dealers it is hardly surprising that much of the public controversy about the industry over the years, leading for example to the Federal Trade Commission investigation of 1938, was generated by dealers trying to gain some added leverage on the manufacturers. The system survived until 1949¹⁰, however, with the added consequence that entry for new producers was made much more difficult by virtue of the necessity of starting an entirely independent dealer network. [13]

A second noteworthy feature of the system was the relative lack of in-house technical innovation by the major producers from the very beginning. Ford, of course, started as an assembler and believed he had assembled the ultimate product. Research was therefore restricted to means of reducing production costs. At GM a nearly disastrous experience in 1923 with the Chevrolet "copper-cooled engine" (which led to the industry's first recorded recall campaign when the engines failed to stand up to typical consumer use) [14] convinced Alfred Sloan that product elaboration using proved technologies was a better idea for overtaking Ford. Responsibility for technical innovations from that point was effectively transferred to suppliers where it has remained to date. Given the modest resources of suppliers (compared with the vastness of GM and Ford) and the great difficulty in convincing the manufacturers to adopt any radical technical change, it is hardly surprising that the pace of innovation from the late 1920's to the late 1970's was extremely

¹⁰ In that year, the Supreme Court ruled in Standard Oil of California and Standard Stations Inc. vs. U.S. (337 U.S.293 (1949)) that oil refiners could not enforce exclusive franchise agreements with their franchisees. The case applied by extension to auto franchises and exclusive selling clauses were from that point eliminated from franchise agreements. However, because the post-war entrants were by this point on their last legs and because the big three dealer networks were quite stable the decision had no practical significance until the arrival of the imports in the late 1950's, of which more in a moment.

modest.¹¹

A third noteworthy feature of the mature auto industrial system was the labor relations system based on a combination of high wages and extreme regimentation. Ford, for example, made it a policy to keep wages 20 to 25 percent higher than wages in other industries for comparable skills. This dampened the move to unionization both because wages really were high and because Ford, with the assistance of Harry Bennett and his security department, could be selective in hiring and weed out workers with union sympathies. In return for the high wage, Ford demanded very hard work and a minimum of feedback from employees. GM's approach was very similar and the tactics were successful in delaying the arrival of the UAW until 1938 at GM and 1941 at Ford. However, the policy carried a price for the long run in that the high wage level in combination with adversarial shop floor relations made the industry vulnerable to both price and quality competition in the post 1973 period.

What of the political tendencies of this "industry of industries"?¹² On one level they are notable during the first phase of the product cycle for their absence. The industry developed behind a high tariff wall erected long before by other sectors, it perfected a product not immediately in need of supporting infrastructure (i.e., a high quality road system), and its research and development costs were so modest that the lack of military interest was a help rather than a hinderance. Thus the politics of automobility were extremely limited. A major problem which did emerge by the 1920's was the retarding effect on vehicle exports of the world tariff structure, but this belongs properly in the next section.

¹¹ William J. Abernathy, The Productivity Dilemma: Roadblock to Innovation in the Automobile Industry, Baltimore: Johns Hopkins University Press, 1978, makes much of the extreme capital intensiveness of many existing production processes such as engine transfer lines which acts to inhibit radical change.

¹² The phrase is Peter Drucker's in The Concept of the Corporation (New York: John Day, 1946, p. 176) and aptly describes the industry even in the initial phase of its development.

Phase II - The Beginning of Export Sales [15]

The first and second phases of the auto product cycle are difficult to distinguish chronologically because American producers pursued export markets from the earliest days of the industry. Henry Ford, only a year after commencing operations in Detroit (in 1903), established a subsidiary for Canadian sales. And in 1905, in order to avoid the 35 percent Canadian tariff on assembled vehicles, he commenced local assembly. General Motors, founded in 1908, was exporting by 1911, and most of the other American manufacturers had some export sales even in their first year or two of operation. In 1906, the first year for which reliable data are available, exports exceeded imports by nearly fifty percent (1,850 units to 1,106) [16] and the gap widened rapidly thereafter. However, to build a significant export market American producers had to overcome several barriers.

The first, remarkably similar to that facing the Japanese in the U.S. market a half century later, was a reputation for a cheap but low quality product unsuited to European conditions.¹³ Olds and Duryea at the turn of the century had exported one- and two-cylinder motorized buggies to Europe and these had fared badly in comparison with European touring vehicles which were only slightly more expensive after freight charges and tariffs. The Americans needed a quality product which was cheaper than European models offering similar performance. Ford, of course, had this after 1908.

The second problem was the rudimentary transport systems of the day and the transshipping required to deliver American autos from Detroit fully assembled. Ford soon discovered that considerable cost savings and increased delivery reliability could be obtained by local assembly, even at low volumes. Thus, Ford assembly plants were opened at Windsor, Ontario, in

¹³ Europe with its large population and high per capita income was viewed in the early days as the prime export market although Argentina and Australia eventually proved more lucrative.

1905, at Manchester in 1911, at Bordeaux in 1913, and in Argentina, Brazil, Denmark, Ireland, Spain and Uruguay by 1920. During the 20's additional operations were started in Australia (at five sites), Belgium, Chile, Germany, India (four sites), Italy, Japan, Malaya, Mexico, South Africa, and Turkey, for a total of 28 assembly operations in 20 countries by 1929. [17]

Because Ford was intent above all on reducing costs and believed that rapid growth in export sales could reduce the price of the domestic product it is not surprising that Ford moved into foreign markets more aggressively than GM where Alfred Sloan was busy filling out the model line. GM's first foreign assembly operation was only opened in 1923 but thereafter, spurred by the fear of being locked out of foreign markets by Ford, expansion was rapid. By 1929 GM had 19 assembly operations in 15 countries and 70 percent of GM's exports were assembled overseas. [18]

Although final assembly accounts for only about 15 percent of the value added in automobile manufacture, [19] local assembly generally had the further benefit of reducing tariffs more than proportionally to the value added. This was important in terms of sales volume since demand was price elastic in foreign markets with their lower per capita incomes and skewed income distributions, even when, as was normally the case, there was no local competitor with a product of comparable quality, much less at a lower price.

It is hardly surprising the American auto makers from the beginning were enthusiastic free traders. James Couzens, secretary of the Ford Motor Company and guiding hand behind Ford's early export drive, was telling the House Ways and Means Committee by 1908 that Ford "...unalterably opposes any increase in [the existing 45 percent] tariff. We believe that this so-called infant industry is fully protected...and, in fact, we believe that the present tax is a greater protection than this industry should have." He went on to argue that the tariff should be set at a level to equalize the difference in American versus European labor costs which he characterized as

"insignificant" due to the greater American use of machinery. [20]

After World War I Henry Ford adjusted his political sentiments (which had been strongly isolationist prior to 1917) to correspond with his emerging financial interests. He fervently supported the League and internationalism and renewed his call for elimination of U.S. trade barriers, now extending it to all products. The Dearborn Independent, Ford's magazine, routinely denounced "the chemical-dye trust, the sugar trust, the lumber trust, and the oil trust" for lobbying for higher tariffs and complained upon passage of the Fordney tariff in 1921 that "...plainly the few big beneficiaries...have been considered more than the consumer." [21]

General Motors also presumably found free trade in its interest, particularly as its foreign operations burgeoned in the 1920s, but its management maintained a discrete silence after 1920 when DuPont, the ring leader of Ford's "chemical-dye trust", gained financial control in the wake of Billy Durant's final disaster. The DuPont interest in GM, made possible and necessary by DuPont's munitions profits from the first World War and its need to rapidly find a new industry to invest them in, continued up until 1957, leaving Ford to carry the public campaign for lower tariffs.

Phase III: Foreign Manufacture

The Smoot-Hawley tariff of 1930, vigorously opposed by Ford and the remaining independents in the auto industry and by practically no one else, effectively ended export sales from the U.S. as tariff walls sprang up all over the globe. Exports peaked at 546,000 units in 1929 (10.2 percent of total U.S. motor vehicle production) and have been practically negligible as a percentage of total sales since the depression.¹⁴ Ford and GM responded to the

¹⁴In 1978 the U.S. exported 955,000 vehicles, about 7.4 percent of production. However, two thirds of these were destined for Canada, from which the U.S. imported 1.2 million vehicles. U.S. exports to and from Canada in 1929 were approximately zero due to tariffs but the North American motor vehicle industry has been fully integrated since shortly after tariffs were eliminated under the U.S.-Canadian Automobile Agreement of 1965. Thus, U.S.

retaliatory tariffs imposed in almost all foreign markets by initiating full manufacturing operations with very nearly 100 percent local content in national markets large enough to make this profitable (and where they could gain entry.) Ford built a scaled down replica of the River Rouge plant at Dagenham, England in 1931¹⁵ and more modest manufacturing facilities at Cologne (1931) and Strasbourg (1934). A fourth European facility at Livorno, Italy was planned but Giovanni Agnelli of Fiat vigorously protested to Mussolini that a domestically owned industry was vital to Italian development and government approval was denied.¹⁶ [24]

GM, because of its later entry into export markets and the crowded nature of most national markets in Europe, chose to buy established manufacturers. By 1930 GM had acquired Vauxhall, a small English manufacturer, and Adam Opel, the largest German firm. Italy, however, was closed to GM and repeated efforts to buy out French firms were unsuccessful (thereby saving GM from the problems Ford-France encountered in an intensely nationalistic market before finally selling out to Simca in 1954.)¹⁷

Chrysler, still struggling to develop a consolidated domestic line com-

14 (contd.)

and Canadian exports outside of North American are the best comparative measure. In 1978 these totalled only 411,000 out of combined production of 14.7 million or about 2.8 percent. [22] Japan, Germany, France and Sweden by contrast were exporting more than half of their domestic production in the late 1970s. [23]

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The Rouge and Dagenham were high water marks in vertical integration, containing their own steel mills, foundaries, and glass making operations. As such they were the extreme embodiment of Ford's notion that vertical integration to reduce production costs was the key to market dominance. Since the early 1930's the pattern in the industry (including at Ford) has been toward less integration except at facilities in less developed countries such as Brazil and Argentina where the lack of local supporting industries has necessitated in-house manufacture of all major components.

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The Agnellis have apparently lost their grip in the 1980s. Nissan has just signed a major co-production agreement with Alfa-Romeo, Fiat's state owned rival, to produce a new vehicle which will present Fiat with serious domestically produced competition for the first time since WWI. [25]

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Simca was itself the French owned survivor of a previous foreign incursion -- Fiat France. It was purchased in turn by Chrysler in the 1960s and this led to the defeat of a third multinational when Chrysler France was bought out by Peugeot-Citroen in 1978 with strong government backing. [26]

petitive with GM, stayed home until the 1960s, a decision central to the firm's current troubles.

While the Smoot-Hawley tariff and the accompanying foreign reaction did cause manufacturing to move from Detroit to foreign sites this development should not be attributed to the economic logic of the product cycle. As Ford Motor Company correspondence of the period makes clear¹⁸ none of the new foreign manufacturing facilities could produce autos as cheaply as Detroit even though they were 3500 miles closer to the consumer and using cheaper labor. The problem was that even the European market as a whole was not large enough to absorb the 400,000 copies of each model each year needed to gain the full benefit of scale economies in auto manufacture. Thus corporate decisions to move manufacturing were strategic, in response to political decisions of foreign governments. They served to speed up the product cycle which would otherwise have continued in Phase III, keeping practically all production centralized in Detroit for some years to come.

A similar situation arose in the immediate post-war period when Australia, Argentina, Brazil, and South Africa began to require nearly 100 percent local content in autos sold in those markets. Ford, GM and Chrysler generally complied, particularly to the extent they could gain guarantees that local production would be limited to a few firms and that competition from firms without local manufacturing operations would be effectively banished by tariffs or quotas. However, in each case production costs were actually higher than in Detroit despite lower wage rates. Thus exports to third countries were not generally feasible and import of the product back to the home market was not at all attractive.

This situation seems very curious, accustomed as we are to the notion that countries with low wage rates should more or less automatically be able to export at lower costs. However, in the case of the auto industry where

¹⁸ Wilkens and Hill, *op. cit.*, p. 240, review internal Ford correspondence in which sales managers in other European markets pleaded with the home office to be allowed to buy vehicles from Detroit rather than from Dagenham, Cologne or Strasbourg due to the substantial cost savings.

production labor is not a large share of value added and where scale economies are extremely significant, low labor costs do not necessarily translate into export competitiveness. Costs at foreign sites are often inflated by the necessity of producing practically all components in-house for lack of supplier industries and by training and quality control costs due to inexperienced workers. Thus, a producer in small national markets such as the countries requiring local manufacture after WWII would need to export 90 percent or more of its output to increase volumes to an economic scale. This in turn would require a tremendous foreign investment by the parent company and a decision to write off a great deal of existing domestic capacity. This generally does not occur in oligopolistic home markets, as recent experience shows, until parent firms begin to encounter significant foreign competition from independent producers.¹⁹

The first foreign production decision by American auto producers based on economic rather than political factors was seemingly the investment in Europe after the Common Market relaxation of intra-European tariffs in 1959. Henry Ford II had been a major promoter of European integration in the 1950s²⁰ which was understandable given Ford's inefficiently large investments in small national markets. Once tariffs were lowered Ford moved rapidly to rationalize production, lower costs, and increase its scale of operations so as to increase its share of an otherwise fragmented European market composed of about 20 nationally oriented

¹⁹ For a more general discussion of the problems of establishing auto production in less developed countries see Baranson, Automotive Industries.

²⁰ In particular Ford campaigned tirelessly to lower American trade barriers as a means of increasing exports of all European countries to the U.S. This, it was hoped, would reduce the fears of individual European countries about the effects of intra-European tariff relaxations. His speech in early 1953 to the Inland Daily Press Association [27] was the kick-off of this campaign which continued even after 1959 and on up to the Kennedy round of tariff negotiations. [28] Ford's continued enthusiasm was based on the belief that the integrated European economy would boom (and its consumers would buy cars) to the extent that North America provided a growing market for European exports.

producers. GM, ever concerned about being shut out, did likewise. Chrysler brought up the rear buying up marginal producers in Britain and France as well as their licensees in Spain.

Just as these decisions were being made the indigenous European producers were gearing up for greatly expanded European sales and an assault on the American market which we may now characterize as the false dawn of phase IV of the product cycle.

The conditions producing this situation are worthy of a moment's consideration since they are in many ways similar to those of the period twenty years later when the arrival of Phase IV is again being trumpeted, this time traveling from the opposite direction. After about 1931 the nature of the European auto market changed radically. Personal incomes dropped precipitately and gasoline taxes were raised dramatically to reduce petroleum imports and support currencies. In a process rather similar to that underway now in the U.S. European manufacturers decided that the environment of auto use had changed and began to produce new products more suited to a spartan era. Ford, for example, worked frantically to slash the weight, cost and fuel consumption of the Model A (a process known today as "downsizing") and produced the Model Y in only eleven months.²¹

From this point the shape and scale of European autos were distinctly different from American autos and the differences persisted even in the post-war boom years because all European governments faced foreign exchange shortages and therefore kept gas taxes very high to hold down oil imports.

Initially the Europeans perceived no market in North America for their products, a view seemingly confirmed by experience with the Model Y which Ford of England attempted to export to Canada throughout the 1930s. Although it faced no tariff (as a Commonwealth product), had low operating costs, and

²¹ See Wilkens and Hill, op. cit., pp. 240-247, for an account of the process which highlights the simplicity of the industry even in that era compared with today when three and more generally four years are required to develop a completely new product.

was cheaper than any other new car available in Canada, sales were meager. However, by the mid-1950s as the prospect loomed in Europe for a relaxation of trade barriers and higher intra-European production volumes and as the North American market added two car families who might seek greater diversity, the Europeans saw a chance. The recession of 1958-59 with its spur to economy mindedness was the trigger and European import sales rose rapidly to 610,000 units in 1959, slightly more than ten percent of the market.²²

In the ensuing years some peculiar things happened to the European threat. First, European currencies strengthened greatly against the dollar; second, European wages rose more rapidly than American wages; and third, the American producers (who were understandably reluctant to compete with their own domestic products) became the most dynamic forces in the European market. Thus the typical European auto imported in America has evolved from the cheapest (the VW of the 1950s) to the most expensive (Mercedes, Peugeot, Volvo, BMW, etc.), volume has never much exceeded the level of 1959 (1979 volume was 557,000), Volkswagen itself is immigrating to Pennsylvania and Detroit, and the European import share has fallen to about 5 percent of the total market²³ even during the current import flood. With the exit of Fiat from the low priced market,²⁴ the removal of remaining Volkswagen production from Germany to Detroit (and Mexico) by 1983, and plans by Detroit to compete more vigorously in the mid-sized luxury car market, it

²² The Europeans were also aided by the fact that domestic dealers were now able, and in many cases willing, to "dual." Thus, development of a dealer network was much easier than for previous entrants.

²³ These figures are not the whole story because European imports are much more expensive vehicles on average than Japanese vehicles. Thus as a percentage of total dollar auto sales and import dollar sales their performance has been somewhat stronger.

²⁴ See "Inflation, Exchange Rate Stymie Fiat," Automotive News, March 17, 1980, for an account of the demise of Fiat's low priced Strada model due to a strengthened lira and rapidly increasing production costs, and the company's attempt to recast itself as a luxury producer in the Volvo-Audi-BMW image.

seems that the European threat is contained.

Phase IV: Import of Autos into a Saturated Home Market?

The extraordinary surge in Japanese market share and the collapse of the new car market during the second energy crisis beginning in mid-1979 seem on the surface to be strong evidence that the fourth stage of the product cycle is at hand. And several of the domestic producers along with the United Auto Workers are reacting as if it were. However, to reach a firm conclusion that this is not another false dawn we need to look carefully at the nature of the saturated market, the character of the Japanese threat, and the potential responses of domestic producers.

As for the auto market, its most curious aspect is the extraordinary period of time which has been required to reach a saturated, replacement-only stage. In fact, it seems not to have been reached yet. After the pent up demand of the war years was worked off by about 1955 (and as the last of the independents, who had been sustained in the sellers market, died off) the market slumped from about a 10 percent per year increase in total motor vehicle registrations during 1945-1950 to about 4 percent during 1955-1960.²⁵ However, the arrival of the baby boom generation at driving age, additional elaboration of the product via the introduction of compact and sporty cars, major government initiatives to improve the roadway system, and Keynesian stimulation of the economy in the Kennedy administration served to stabilize growth of total registrations during the years since 1955 in the range of 4 percent (compared with population increases during the period averaging about 1 percent per year.) And, as one looks at the next decade

²⁵ Total motor vehicle registrations seem to be the best measure of the strength of the market for several reasons. First, it is important to include trucks along with cars since the same producers make both and we are concerned here with the overall health of the industry. Second, registrations are a good bit less volatile from year to year than new car sales and thus rates of increase are easier to estimate. Third, producers achieve a considerable portion of their profits from replacement and crash parts sales which correlate more nearly with total registration than with new vehicle sales.

with the need for a new fleet of energy efficient vehicles and the opportunities this provides for further elaboration of the product,²⁶ it appears that if phase IV is imminent market saturation is not a major reason.

Even assuming continued growth in the auto fleet the surge of Japanese imports is impressive evidence of phase IV. What can we say about the nature of this threat? Perhaps its most significant attribute is the independence of the Japanese auto industry from the American multinationals. Just how this came about is not altogether clear²⁷ but it is striking that Japan has been the only country in the post war world to develop its auto industry in isolation from Ford, GM, and Chrysler.

Contrast the experience of European producers in their assault on the American market beginning in the late 1950s: Even as they directed their attention to the U.S., GM, Ford and Chrysler were stepping up their efforts in the European market where GM and Ford were already well established. Massive investments in new plant initially permitted the Americans to export cars to the U.S. to compete with other European imports in the compact car market. However, the American producers had nothing to gain from competing with their own domestic lines of larger cars since this would have threatened their massive investments in U.S. production facilities. Instead, once the domestic compacts were in production American imports from Europe were phased out and the spare European capacity was turned aggressively to price competition in the European market, made possible by the high production

²⁶ General Motors, for example, has announced plans to market a two seat "commuter car" in 1983 and an electric vehicle in 1984. [30] And Chrysler, even as it abandons the full-size end of the market, has announced plans for a range of fuel-efficient mini-vans and mini-trucks to be built in the mid-1980s on the K-car chassis. [30] The hope of automotive product planners is that as gas prices rise and fuel efficiency is demanded for urban cars the number of vehicles per household will increase since several types of vehicles will be needed to accomplish the full range of trip purposes.

²⁷ John Roberts [31] provides considerable detail on the American occupation and the origins of "Japan, Inc." but offers no explanation of the impotence of Ford and GM in gaining entry to the Japanese market despite their successful entry into every other country in the non-communist world.

volumes. As a result, the Europeans were soon thinking less about exporting to America and more about meeting American competition in their home markets.

The European lesson was not lost on the American multinationals but then neither was it lost on the Japanese who successfully resisted repeated American efforts to gain low tariff access for American vehicles and, later, to buy controlling interests in Japanese producers. [33] Increasing American ownership has been permitted over the years -- GM acquired a 34 percent interest in Isuzu in 1973, Chrysler (prior to its recent troubles) obtained 15 percent of Mitsubishi Automotive, and Ford purchased a quarter interest in Toyo Kogyo (Mazda) in 1979 -- but under the Japanese system of corporate finance where one or a few banks own the remainder of the stock the American shares confer nothing in the way of corporate control.²⁸ Japanese law has permitted 100 percent foreign ownership since 1978 but none of the remaining stock is for sale (even if the American companies at this point had the cash to increase their interest) and it appears that the Japanese financial community would prefer to risk tariff or quota exclusion from the U.S market rather than permitting multi-national control of Japanese producers.²⁹

The contrasting European and Japanese experiences serve to confirm the observation of the neo-Vernon school that in the absence of an independent

²⁸ Recent evidence that the American shares provide some profits for Detroit but little in the way of control lies in Isuzu's announcement that it will establish its own dealership network in the U.S. and begin importing cars to compete directly with GM's compact and subcompact models. [32] Mitsubishi is reported to have similar plans for 1982 and Mazda has retained the dealership network it had developed before Ford acquired its interest.

²⁹ Despite much multi-national ballyhoo to the contrary about restrictive Japanese import practices, Japanese producers would actually face no threat from American imports even with totally frictionless import and vehicle certification procedures. (All tariffs have already been removed making Japan practically the only country with no auto tariff.) Ford Motor Company Executive Vice President Fred Secest in a speech at MIT May 14, 1980 estimated that at then current Yen/Dollar exchange rates (roughly 240Y=\$1) the Japanese enjoyed an \$800 per car cost advantage for compact cars landed on the U.S. west coast. By extension, the Japanese home market cost advantage over comparable U.S. vehicles would be about \$1100. Thus the only hope for the American companies, as has long been recognized in Detroit, is to purchase Japanese companies, invest heavily, and undersell the other Japanese producers in their home market on the basis of higher volume.

foreign producer the fourth stage of the product cycle may never arrive in the country where the product originated regardless of factor prices in other countries. If the producers from the originating country lead a world oligopoly (as was the case with American auto producers from the 1920s until the mid-1970s) they will have little of an economic nature to gain from a move to off-shore production with imports back to the home market no matter how cheap labor or other factors of production may be in other countries: Captive imports will simply undermine the value of their home country investment. And they may have much of a political nature to lose by a move off-shore. The American dominated oligopoly of the post war period therefore arrested the product cycle in phase III and, in the absence of the independent behavior of the Japanese, Detroit would have sailed happily into the 21st century as the continuing world auto champion. Prices to consumers would doubtless have been somewhat higher but the employment base and profits of the industry would have been secure.

Key supporting evidence for this conclusion lies in Detroit's use of its manufacturing investments in less developed countries with lower labor costs. GM, for example, has manufactured (not merely assembled) automobiles in Argentina since the late 1940s and in Brazil and Mexico since the early 1960s. And labor costs in each country are a fourth or less of U.S. wages. Yet GM made no plans to expand output to an efficient level and to export the extra production back to the U.S., until the extent of the Japanese threat became apparent in 1979. Ford's behavior has been identical as was Chrysler's prior to the loss of its overseas empire in 1979. Clearly the advent of "world car" and the move to integrate world-wide production by the American multinationals owes rather more to the Japanese and rather less to the product cycle than would have been the case if the American auto industry had consisted of twenty fiercely competitive independents instead of the Big Three.

Japan as possessor of the world's most dynamic and carefully coordinated economy is a formidable competitor in the short run, particularly during the next two years while Detroit prepares new models suited to the new energy order, but Japan is clearly the wrong country to sustain the fourth stage of the product cycle. A moment's reflection indicates that Japan would only be able to do so if its social control and financial management mechanisms were adequate to permanently hold wages below levels in other advanced countries with comparable standards of living and to keep the yen weak in relation to the dollar. Otherwise Japan will follow the path of Germany where wage increases and a strong mark priced Volkswagen out of the North American low-price market.

Japanese wages may continue to lag somewhat due to the system of company unions, the weakness of the socialist parties, and the advantage for management of conducting wage negotiations in the "us-versus-them" framework which is possible so long as the producers are domestically owned³⁰, but the yen is another matter. It has been marching resolutely onward and upward since August 1971 when the yen was allowed to float against the dollar. The merest hint of an energy crisis sets this process back since Japan is practically 100 percent import dependent for energy, but it is clear that barring a middle eastern political disaster the yen must, within a few years and possibly much sooner, reach the 190Y = \$1 level which is conventionally cited as the point where the Japanese production cost advantage disappears.[34] (As this was written the yen had strengthened to 210Y = \$1 from 250Y = \$1 in April 1980 at the height of the Iran crisis. The yen actually passed the 190Y = \$1 level very briefly in October 1978, the month before Iran fell apart.)

Thus a long range perspective suggests that the true significance of the Japanese threat lies in breaking the American led auto oligopoly which was

³⁰ However, it is important to remember that the seniority based wage system will exert additional upward pressure as the Japanese auto industry matures.

able to damp price competition in the post-war period and thereby avoid phase IV. It should be clear that if this analysis is correct a continuation of price competition in the absence of significant elaboration of the product will inevitably lead all major world producers, American, European, and Japanese, to source most vehicle components in low cost areas, principally Argentina, Brazil, Mexico, Taiwan, Korea, and Malaysia.

PART II. THE SEARCH FOR INDUSTRIAL POLICY

The rapidity of Detroit's collapse and the lack of public policy precedents to deal with declining sectors has thrown both Detroit and Washington into a gigantic muddle. One government agency, the International Trade Commission, has ruled that imports are not the problem (i.e., that phase IV is not really here), another, the Department of Transportation, has campaigned under a Democratic and now a Republican secretary for import restrictions, the White House under Carter and Reagan has played for time by commissioning studies, and Congress has passed a resolution urging the president to act decisively to halt the Japanese flood. The automakers, for their part, have split on trade policy, flip-flopped in their attitudes toward government assistance with product development, and cast about erratically for "southern strategies", robotics, off-shore component sourcing, and other means of altering the industry's relation to its workers.

Our modest contribution to this debate will be to outline the options before the automakers and their employees in the absence of government assistance and to compare these with the range of government actions which might be fashioned into an "industrial policy" for the auto sector.

"Self-Help" for the Auto Industry and Its Workers

An obvious route to industry self-help is to accept the logic of phase IV and move production to low labor cost areas. Ford and GM have apparently accepted this argument at least for the compact and subcompact markets. Both have recently

announced major

investments in Mexico, Brazil, Taiwan, and Malaysia as well as co-production of components with several Japanese producers in which they own partial interests. The scale of the investments is enormous given the size of these national markets and it seems inevitable, although the companies have not stated this explicitly, that most of the output is destined for the U.S. Indeed, William Abernathy of the Harvard Business School has argued that the economics of auto production are now such that in the absence of decisive government action to support the U.S. industry American producers will shift practically all the value they are now adding to domestically produced vehicles to off shore production sites within 10 to 15 years. [35] Final assembly will doubtless be retained in the U.S. so that the vehicle can be labeled "American made", particularly since the final assembly operation, which now only accounts for 15 percent of the value added, can be automated with robots to reduce the use of expensive American assembly labor to a very low level.

This approach to the problem has caused some embarrassment for Ford recently due to the inconsistency between the company's appeal for import protection and its furtive moves toward foreign production of engines for its new subcompact cars³¹ but the industry is likely to be tenacious in pursuing it. One of the industry's most important weapons in efforts to make such moves politically acceptable will probably be government assistance in finding new jobs or providing long-term unemployment benefits for displaced

³¹ Details of Ford's corporate thinking on the problem of moving off-shore were leaked to Senator Metzenbaum of Ohio who passed the material along to the New York Times. An assessment of the political problem facing the company prepared by the company's Office of North American Governmental Affairs noted: "The juxtaposition of any such action (a move to Mexican sourcing of compact car engines) with whatever push Ford may make to restrain Japanese imports needs to be weighed. The credibility of any effort we make to impose local content requirements or quotas on the Japanese could be undercut by our sourcing engines [off shore] for Ford's U.S. cars. On the other hand, we could say, quite correctly, that the competitive situation in the industry compels us to take advantage of some low-cost sourcing to keep up with other manufacturers."

workers. Existing legislation under the Trade Act of 1974 was adopted at the behest of the United Auto Workers and has had the ironic effect of damping resentment toward the Japanese invasion³² but much more vigorous measures would be needed if the industry wishes to move off-shore in a major way. And this raises the obvious question of where the work force finds work when the industry of industries leaves town.

Even as Detroit tentatively embarks for offshore production, it should be clear that this step is broadly undesirable to the major producers (for political and economic reasons) and to their workers (on obvious economic grounds)³³. Several other paths to self-help are clearly preferable: (1) diversification or product or process elaboration, (2) reduced labor costs, and (3) industry restructuring to incorporate the Japanese producers in a new world oligopoly where the competition (if any) is on some other basis than price. What are the prospects for these alternatives?

(1) What might be termed "technical self-help" might take several forms. One would be to diversify out of the auto business into new growth sectors. A second would be to introduce new capital intensive production technologies which reduce costs while improving the quality of the product. A third would be to introduce a new product -- an electric car, for example, with operating and production costs lower than competing internal combustion vehicles but with comparable performance -- which could not be quickly duplicated by foreign rivals. However, none of these offers much hope.

Where, after all, does the "industry of industries" diversify, particularly given the industry's lack of success with non-auto product lines in the

³²It is important to remember that relatively few auto workers are now feeling the full effect of the slump in domestic sales. More than 90 percent of the workers on indefinite lay-off are receiving supplemental unemployment and trade assistance payments which may total 95 percent of their base pay. Both types of payments run for up to as much as eighteen months. Thus the real impact of the auto slump on the work force will become apparent later in 1981.

³³Of course, this step might be a bonanza for consumers in the advanced countries and for auto workers in Brazil, Mexico, etc. As always with trade policy, what you think depends on where you sit.

the 1960s and 1970s.³⁴ Investment in more capital intensive production facilities might have offered some promise in years gone by, but the technology is as available to the Japanese as it is to the Americans³⁵ and the financial strength of the Japanese industry compared with the growing weakness of the American industry makes it increasingly unlikely that the U.S. producers can gain any advantage via the high technology route.³⁶ Finally, no new products are on the horizon which might provide a technical/quality edge to American producers.

(2) Since wages account for a very large portion of auto production costs and since the heart of the American dilemma in phase IV is our historically high wage level, the producers understandably find a new wage policy keyed to foreign wages highly attractive. Initial efforts in this direction in the form of General Motors's "souther strategy" of building new production facilities in sun-belt states with anti-union traditions have been inconclusive [38] but the latest round of the Chrysler loan negotiations suggest that union attitudes may be changing in the face of massive job loss. Chrysler workers have agreed to

³⁴ GM left the aircraft business after WWII, sold its money losing home appliance line in the late 1970s and has just sold its Terex construction equipment division in order to raise cash for new auto tooling. [36] Ford tried but failed in the consumer electronics business in the 1960s through its purchase and subsequent sale of Philco. Chrysler never diversified beyond such near-automotive activities as tanks and marine engines (which have been grouped together to expedite sale as a last gasp measure if the company's fortunes continue to slide.) And American Motors suffered large losses in the transit equipment business in the 1970s -- before abandoning the field to GM. Thus the companies have never diversified with success in any direction and would probably encounter an additional problem with large scale diversification in that acquisitions of an attractive size would entail problems with the Clayton Act in the absence of a congressional exemption. [37]

³⁵ Following industry practice, most of the development work on robotics has been underwritten by independent vendors not controlled by Detroit. As a result the industry has very little proprietary technology.

³⁶ More ominously, it appears that the Japanese are determined to travel this path even if the Americans don't and dramatic American productivity improvements may be essential simply to stand still. In part, automation addresses anticipated Japanese labor shortages in the 1980s and the delayed impact of the seniority based wage system. Perhaps more important, it serves to "Korea-proof" and "Taiwan-proof" the Japanese industry in the event that the predominant American multinational counterattack comes from the production facilities now under development by the Americans in those countries.

forego wage increases during the remainder of their contract with the result, assuming continued inflation in the 10-12 percent range, that their real wages will decline by about one quarter.

GM and Ford have taken note of the Chrysler agreement, vowing to achieve a comparable wage agreement in the next contract. However, prospects for a substantial reduction in real wages are unclear. The issue is tied intimately to the survival prospects of GM and particularly Ford, the market success of new models being introduced, and the terms of any negotiations on tariff protection.

(3) The third alternative to a rapid march off-shore is simply for governments to stand by while the leading American, European, and Japanese manufacturers make a deal. And this process is well advanced already: Renault has obtained a controlling interest in American Motors and owns 10 percent of Volvo (with an option for greater participation); Peugeot has purchased Chrysler's properties in France, Britain, Spain and Argentina; GM has just acquired a 100 percent interest in Saehan Motors, South Korea's third largest producer, as part of its now familiar gambit to buy out independent producers before they become a serious export threat³⁷; Nissan and Toyota are negotiating for purchase of Seat of Spain; Chrysler is practically under government order to quickly find a merger partner as a condition of the most recent loan guarantee; etc.

Co-production agreements are proliferating even more rapidly: Renault is co-producing engines and other mechanical components with Volvo, Peugeot, and Fiat; Peugeot, in addition, is negotiating with Chrysler to produce large models in the U.S.; Nissan will be in co-production with Alfa-Romeo in the south of Italy in 1984; Fiat has marketing and co-production plans with Saab in Scandinavia

³⁷ Recent events in South Korea raise two interesting additional possibilities. The new government has just ordered one of the country's three auto makers closed and the other two to be merged. If Korea has in mind a Japanese style independent assault on the world market it clearly must expel the multinationals and this may be the key step. Alternatively, GM may have sewed up the industry (the GM firm is one of the two to be merged) and have plans for the Korean production facilities as a key element in its counter attack on the Japanese in the American market.[39]

and with Peugeot in Latin America; Honda is co-producing an auto in Britain with BL Ltd.; and Ford and Toyota are negotiating a major co-production deal in the U.S.³⁸ The popularity of this approach lies in its usefulness for ending price competition (since the mechanical components in various makers' lines become practically identical even though the sheet metal is different) without the need for mergers (which threaten national sovereignty) or more direct collusion (which at least in the U.S. and Germany runs counter to anti-trust laws.) And it gives the auto makers considerable latitude in sourcing which may provide greater leverage in labor negotiations and tariff disputes.

The conventional wisdom in the auto industry now holds that only six or eight companies (out of 19 now producing 100,000 or more passenger cars per year in the non-communist world) will survive into the 21st century. And the spread of co-production agreements might easily reduce the true degree of competition to practically zero.

The march toward re-oligopolization seems certain to present ironic and troublesome choices for American public policy in the near future since the options will be rather stark: In the absence of successful industry self-help or effective industrial policies for auto industry "revitalization" (where "effective" measures are defined as those which cannot be easily matched by the governments guarding the competing producers) a truly competitive world industry will drift inexorably off-shore. A revitalized oligopoly may provide an easy means of dealing with the problem -- drift will cease since the producers will no longer compete on price, and the costs in the form of higher consumer prices and reduced rates of innovation will be largely hidden -- but such an approach will require an explicit acknowledgment that competitive capitalism is no longer compatible with American interests when key industries enter the fourth phase of the product cycle.

³⁸The European producers have also initiated an effort to "co-produce" new technologies. Renault, Peugeot, Fiat, Volkswagen, BL, and Volvo have recently agreed to pool their long-term research efforts. The intent may be, as announced, to steal a march on the Americans and Japanese but an equally likely result would seem to be that no European producer will disadvantage its "competitors" by means of a technical coup. [40]

The Options for Industrial Policy

Given the uncertain prospects for industry self-help and the incompatibility of re-oligopolization with American ideology it is hardly surprising that interest has grown recently in industrial policy approaches of the sort outlined above (pp. 10-11). These include (1) government induced demand creation; (2) tariffs or quotas on imports; (3) government assistance with research and development, with new plant, and with regulatory and social welfare costs; and (3) government assistance in de-emphasizing the role of auto production in the economy.³⁹

In the terminology of William Diebold [], the first three activities may be labelled protective in that they aim to preserve the existing industry: Demand stimulation does this by creating a larger market so that both domestic and foreign producers will find an outlet for their products. Tariffs and quotas increase the price of foreign products. Assistance with product development, social costs, and externalities reduces the cost of domestic products in comparison with imports. The latter activity (industry de-emphasis) is essentially adaptive, involving an acknowledgement that auto production is no longer viable domestically coupled with a search for better uses in other sectors for the industry's work force. This approach has proved a formidable challenge even for those governments (e.g., Japan and France) finding it compatible with their political and social traditions. And in America it has hardly been suggested. Thus our discussion will be limited to the political and economic implications of protective policies.

Government induced demand creation is strongly advocated by the industry and the UAW as a means of reviving the market. This approach is hardly a new departure for the industry since Henry Ford II was one of the most persistent advocates of the Kennedy tax cuts of the early 1960s as a means of dealing with the false alarm caused by fears of a European-borne phase IV. [41] And, since 1960, the automakers have generally backed Democratic presidential candidates on the strength of their Keynesianism as well as the traditional

³⁹ A fourth approach cited on p. 10, government actions to restrain real wages, has been employed in emerging countries such as Brazil and Argentina but has not been on the agenda in the U.S. and will not be considered here.

Democratic support for free trade. However, the industry has argued with special fervor for tax cuts and an end to credit restrictions in 1979-80 on grounds that the auto industry has been singularly disadvantaged by tight consumer credit and the recession just at the point when massive new spending is required to introduce new products suited to the new energy price structure.

Free trade has been decisively abandoned by Ford, Chrysler, a number of the suppliers such as the tire companies, and the UAW who have proposed various sorts of import quotas or tariffs but the prospects for protectionism are uncertain. One problem lies in the stance of GM whose continuing support of free trade splits the American industry. GM's strategy has been variously interpreted and may involve a simple business calculation that GM's "import fighters" scheduled for introduction in the next few years will recapture most sales for American producers. Other interpretations more plausible to GM's competitors are that GM will benefit from the departure of Ford and Chrysler from the full size and intermediate segments of the market in order to concentrate on the compact and subcompact sectors. Once import competition has forced this choice, leaving more room for GM in product lines where it can compete more effectively with the Japanese, the company will discover that protectionism is a prudent policy after all. An alternative interpretation holds that GM plans to meet the import challenge by moving much of its component production off-shore and that continued support of free trade is essential to this strategy.

A second impediment to protection of the domestic market is the attitude of the nation's new car dealers. When Chrysler chairman Lee Iacocca and Ford executive vice-president William Bourke addressed the 1980 convention of the National Automobile Dealers Association to urge adoption of a resolution in support of tariffs, they encountered intense hostility and the association's directors instead adopted a resolution opposing any form of quotas or tariffs.

The response should have been predictable considering that more than two thirds of the 24,000 U.S. dealers sell imports.⁴⁰ With an average of about sixty dealerships per Congressional district, and considering the hard sell attitude of car dealers and their willingness to contribute to campaigns,⁴¹ it is hardly surprising that the dealers have become one of the most effective free trade lobbies. And they are likely to become even more organized and united in their support since dealers without an import line are madly scrambling to find one.⁴²

A third impediment to protection of the auto market is the inflationary consequences of import restrictions. While estimates vary widely on the net cost of import restrictions to society⁴³ the price of both imports and domestic vehicles would surely rise substantially if imports were

⁴⁰ See "Fight Over Import Growth Dominates NADA Meeting", Automotive News, February 18, 1980, for details of the convention's response. Note however that two thirds of the dealers also sell domestic makes, evidence of the degree to which exclusive dealing arrangements have declined since 1949.

⁴¹ In the 1978 election the NADA political action committee made \$1 million in contributions to Congressional candidates, out spending the UAW and the AFL-CIO and second only to the PAC's of the doctors and the realtors. In 1980 \$1.2 Million had been raised by August and this was widely understood to be only the tip of the iceberg since dealers make additional contributions at the \$100 personal limit in their own names and through their employees. The results can be impressive. Witness, for example, a Republican senator's explanation to a Times reporter of his decision to vote for the Chrysler bail out: "I don't have any plants in my state but the dealers were all over me." [42]

⁴² Isuzu, for example, has announced plans to develop a dealer network by concentrating on dealers lacking an import line. A spokesman noted that too many rather than too few applicants is the company's current problem. [43]

⁴³ President Carter's Automotive Task Force has reported that limiting Japanese auto imports to 1979 levels would put 100,000 auto workers back to work but would raise the price of new cars by as much as \$1 billion. Congressman Bob Traxler (Dem. Mich.) has rejoined (in a letter to the New York Times, July 27, 1980) that the \$1 billion cost to the consumer in new car purchase price increases is many times outweighed by the \$7.5 billion annual social welfare cost to the taxpayer of supporting 100,000 unemployed auto workers and 200,000 workers in other industries whose jobs are eliminated with each 100,000 drop in auto industry employment. Eric Toder [44] has conducted the most sophisticated econometric analysis to date on the effects of auto tariffs, reporting that as conditions existed in the 1975 sales slump the benefits to American society as a whole from any of a range of tariff policies were far outweighed by the additional costs to consumers.

restricted.⁴⁴ Indeed, if restoration of the competitiveness of the domestic auto industry is the justification for import restrictions it may be vital that domestic producers raise their prices to generate the revenues needed for retooling to meet foreign competition in the future without tariff or quota protection. However, the political consequences of price increases are likely to be severe for the public officials approving quotas, and the disgruntlement of millions of consumers may appear to outweigh the antipathy of hundreds of thousands of auto workers, particularly in the majority of Congressional districts lacking auto assembly and parts plants.

Yet another barrier to protectionism in the auto sector, but one too broad to fully analyze here, is the resistance of other industrial sectors still broadly competitive in world markets. The aerospace industry, for example, has in Japan its best customer and is doubtless strenuously resisting any suggestion that Japanese autos be kept out of the U.S. for fear of retaliation against aircraft exports.

This raises a final problem with auto protection which is just what the Japanese would do with their excess workforce if their autos were excluded from the American market which now accounts for one fourth of the Japanese industry's total sales. One use for the excess labor would lie in developing an independent aerospace industry and one use for an aerospace industry once developed would be to pursue an independent foreign policy. Such prospects are certain to set off alarms in the minds of all but those

⁴⁴ It is sometimes asserted that import restrictions could be negotiated not just with the Japanese but also with American domestic producers so as to prevent price increases. [45] However, this leaves the problem of policing new car dealers who have been hurt as badly as the producers by the slump in the new car market and who would surely find ways to increase prices unless watched continually. And the Japanese importers would presumably raise prices to ration their scarce product.

most narrowly tied to the auto industry and this unspoken pitfall of protectionism doubtless accounts for much of the vigor in the continuing interest of the White House, under Carter and Reagan, in free trade.

Thus the coalition for protectionism faces many serious hurdles. However, the real test on the issue of auto tariffs or quotas is likely to come in mid-1981 when the economy revives, aggregate car sales pick-up, the industry has its import fighters in full production, and the special eighteen-month benefits provided to auto workers losing their jobs due to imports begin to run out. If the Japanese share of the market remains at the current 28 percent or increases further, pressures may become very strong to accept some risks with regard to Japanese geopolitical behavior in order to protect the American market.

Prospects for the third of the "protective" approaches to phase IV are considerably brighter. Politicians in both parties eager to avoid tariffs while aiding the industry have developed a lengthy list of "supply side" aides as well as a stretch-out of the air quality and safety timetables developed in the early 1970s. The former have the undoubted virtue of providing benefits without clearly indicating who must pay for them and also function as "negative tariffs" (i.e., aids to the industry which hold production costs of domestic products down rather than raising the price of imports) which are more difficult for foreign producers and governments to identify and protest.

The stretch-out of regulations is of extremely dubious value in making the industry more competitive in the long run (since the Japanese will also benefit) but does have the short run virtue of freeing up the industry's investment capital for retooling for energy efficient models. The political virtue of a stretch-out is that it is better than abandonment of the goals fought over in the early 1970s. Public officials can argue that the fourth stage of the product cycle is a poor time to push hard on the unwanted side-effects of auto use and that a return of the domestic industry to health is

central to the long run achievement of environmental and safety goals. Thus it appears that the industry "wish list" presented to the Carter White House in the spring of 1980 will be granted in large measure by the Reagan administration.[46]

REFERENCES

- [1] Raymond Vernon, Sovereignty at Bay, New York: Basic Books, 1971, Chapter 3; and Vernon, "International Trade and International Investment in the Product Cycle", Quarterly Journal of Economics, LXXX, (May 1966), pp. 190-207.
- [2] Wassily Leontief, "Domestic Production and Foreign Trade: The American Capital Position Re-examined", Proceedings of the American Philosophical Society, Vol. 97, September 1953, pp. 332-349.
- [3] Vernon, "International Trade....".
- [4] The "phases" listed are similar to those suggested in James Kurth, "The Political Consequences of the Product Cycle: Industrial History and Political Outcomes", International Organization, 33, No. 1, Winter 1977, pp. 1-34, based on a less formal set of stages suggested by Vernon.
- [5] See Raymond Vernon, Storm Over the Multinationals: The Real Issues, Cambridge: Harvard Univ. Press, 1977, Chap. 5; and Ian Giddy "The Demise of the Product Cycle Model in International Business Theory", Columbia Journal of World Business, Vol. 13, No.1, Spring 1978, pp. 90-97.
- [6] Vernon, op. cit., pp. 93-95. I have, in this paragraph, made explicit that which is implicit in Vernon's more general treatment of the behavior of the multinational firm.
- [7] Kurth, op. cit.,
- [8] The ideas in this section have been adapted from Robert Gilpin, U.S. Power and the Multinational Corporation, New York: Basic Books 1975.
- [9] The material in this section on the early history of the auto industry is from James Flink, America Adopts the Automobile, 1895-1905, Cambridge; MIT Press, 1970. For data on entrances and exits from the early auto industry, see Flink's Table 9-2, p.3.
- [10] Flink, op. cit., p. 116.
- [11] Mira Wilkens, "Multinational Automobile Enterprises and Regulations: An Historical Overview", in Douglas H. Ginsberg and William J. Abernathy (eds.) Government, Technology and the Future of the Automobile, New York: McGraw Hill, 1980, pp. 225-226. Rolls Royce also attempted American production at a later date.
- [12] Flink, op. cit., pp.208-209.
- [13] Lawrence J. White, The Automobile Industry Since 1945, Cambridge: Harvard U. Press, 1971, pp. 137-151, provides an excellent summary of manufacturer-dealer relations from the beginning of the industry to about 1967.

- [14] See Alfred D. Sloan, My Years with General Motors, New York: Garden City, 1964, Chap. 5, Especially p. 87.
- [15] This section, unless otherwise noted, is based on Mira Wilkens and Ernest Frank Hill, American Business Abroad: Ford on Six Continents, Detroit: Wayne State Univ. Press, 1964.
- [16] Flink, op. cit., p. 60.
- [17] Wilkens and Hill op. cit., Appendix 2.
- [18] Frederic G. Donner, The World-Wide Industrial Enterprise: Its Challenges and Promise, New York: McGraw-Hill, 1967, p. 15.
- [19] Jack Baranson, Automotive Industries in Developing Countries (International Bank for Reconstruction and Development, World Bank Staff Occasional Paper Number Eight). Distributed by Johns Hopkins University Press, Baltimore, 1969, Table 4, p. 36.
- [20] Cited by Wilkens & Hill, op. cit., p. 37.
- [21] Cited by Wilkens and Hill, op. cit., p. 36.
- [22] Calculated from Motor Vehicle Manufacturers Association, World Motor Vehicle Data (1979 Edition), Detroit: MVMA, 1979, pp. 280-292.
- [23] MVMA, World Motor Vehicle Data, p. 16.
- [24] Details of the maneuvering are recounted in Wilkens and Hill, op. cit., p. 230.
- [25] See "Italy Approves Alfa-Nissan Plan to Produce Cars", Wall Street Journal, Sept. 22, 1980, p.28
- [26] See "There's a New No. 3 in the World Auto Race", Fortune, December 4, 1978, p. 119.
- [27] "The Free World Can't Trade on a One-Way Street" (reported in Vital Speeches, Vol. 19, No. 11, March 15, 1962, pp. 326-330.
- [28] See "New Directions in World Trade," in Vital Speeches, Vol. 28, No. 12, April 1, 1962, pp. 365-367, for Ford's blessing of the Kennedy Administration's efforts to reduce tariffs.
- [29] "Pontiac Grooms Mid-Engine, 2-Seat Commuter", Automotive News, January 28, 1980, pp. 1, 51; and "31-MPG Fleet Average Seen for GM by 1985", Automotive News, July 14, 1980, pp. 1,6.

- [30] "Iacocca Lifts the Veil on Models to Follow K-Car", Automotive News, July 7, 1980, pp. 1, 44.
- [31] "The 'Japan Crowd' and the Zaibatsu Restoration", The Japan Interpreter, Vol. 12, Nos. 3-4, Summer 1979.
- [32] "Isuzu Picks Ad Agency, Sets \$7-million Budget", Automotive News, July 21, 1980, pp. 3, 56.
- [33] William Chandler Duncan (U.S.-Japan Automobile Diplomacy: A Study in Economic Confrontation, Cambridge: Ballinger, 1975) describes American efforts to gain entry beginning in the mid-1950s and continuing to the mid-1970s.
- [34] The rate for the break point is as estimated by the Japan Economic Journal based on discussions with Japanese producers and as reported in Sub committee on Trade of the Committee on Ways and Means, U.S. House of Representatives, Auto Situation: 1980, Washington: U.S. GPO, 1980, p.45. However, it should be noted that National Academy of Engineering has recently come to the more pessimistic conclusion that the break point may be closer to 140Y = \$1. See NAE, "Competitive Status of the U.S. Automobile Industry", 1980.
- [35] William Abernathy, "Statement on the Competitive Status of the U.S. Automotive Industry: Import Implications", presented to the Subcommittee on Economic Stabilization of the Senate Committee on Banking, Housing and Urban Affairs, April 3, 1980.
- [36] "GM and IBH Sign Pact on Terex Sale", New York Times, Sept. 30, 1980, p. D5.
- [37] See Lawrence White, The Automobile Industry Since 1945, Cambridge: Harvard University Press, 1971, p. 89, for a review of the automotive industry's experience in nonautomotive endeavors.
- [38] See "Why GM Abandoned Its 'Southern Strategy'", Business Week, October 16, 1978, p. 50, for details of the strategy and the terms of GM's surrender which permitted the UAW to transfer workers from unionized plants in the north to non-union plants in the south to aid with organizing campaigns. However, to the surprise of both the UAW and management, the union has lost a number of elections in the past year at southern plants even after the arrival of considerable numbers of northern transfers.
- [39] "South Korea Is Ordering Consolidation of Two Auto Makers, One linked to GM", Wall Street Journal, August 21, 1980, p. 26.
- [40] "European Makers Join Hands for Research Work", Automotive News, June 16, 1980, p. 41.
- [41] See for example his speech "Taxes and Prosperity" (delivered July 8, 1963) reprinted in Vital Speeches, August 1, 1963, pp. 717-719.

- [42] "NADA Campaign Contributions Near \$1 Million", Automotive News, October 1, 1979; and "Auto Dealers Flex Muscles in Politics", New York Times, August 10, 1980, p. 31.
- [43] Automotive News, July 21, 1980, pp. 3, 56.
- [44] Toder, Trade Policy and the U.S. Automobile Industry.
- [45] See, for example, Congressman Les Aspin's proposal to this effect, "Aspin Would Tie Curb on Japanese to U.S. Price Lid", Automotive News, July 28, 1980, p. 4.
- [46] See "GM White Paper Proposes Easier Auto Regulations", Automotive News, June 23, 1980, pp. 1, 52; and "Ford Seeks 'Adjustments' in Rules", Automotive News, June 30, 1980, pp. 1, 52, for the industry's "wish list", and "Carter Offers His Plan to Rescue Detroit", Automotive News, July 24, 1980, pp. 1, 41, for the administration's response.