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INDUSTRIAL POLICY AND THE MICHIGAN STRATEGY

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PREFACE

This paper evolved out of concern over the difficulties that manufacturing decline have placed on the State of Michigan. The state's manufacturing industries have not proved to be competitive, a fact which has cost the state large numbers of jobs and economic growth.

The purpose of this paper is to provide potential solutions to the problem of industrial non-competitveness in Michigan. Research indicates that the source of Michigan's difficulty pertains to a problem of productivity in the state's factories. These factories do not produce goods efficiently enough and do not achieve a level of quality that is on par with the competition.

Thus in the pages that follow, the productivity problem itself will be defined, and alternatives will be examined. Particular emphasis will be placed on the automobile industry and the prospects of a revitalization of that industry here in Michigan. Analysis will begin by examining traditional forms of industrial policy. Attention will then turn to a comparison of American and Japanese industrial policy. This comparison will lead to an examination of Japanese transplant operations in this county and their potential contribution to economic recovery. Lastly, attention will be turned to applications of Japanese management to local policy with particular emphasis on the Michigan strategy.

This problem of non-competitiveness has been addressed in both the public and private sectors. Yet much of the analysis to date has foucused on a deficency of investment capital in the industial complex in Michigan. Research indicates that this approach may not resolve the problem, hence this document while place its entire emphasis on industrial recovery based on improved productivity.

PART ONE- SYNOPSIS OF THE PROBLEM

MICHIGAN-A DECADE OF MANUFACTURING DECLINE

The decade of the 1980's has taken the State of Michigan through tremendous structural and economic change. For years the state was a national and international leader in the development, production, and manufacturing of durable goodS. This fact led to high levels of employment and production. However, in the late 1970's and early 1980's the presence of increasingly formibable competition within the United States, and abroad caused Michigan to be less competitive in the markets for durable goods, particularily automobiles. The result of this decline in the state's competitive position was devistating to many communities, industrial cities such as Detroit, Flint and Lansing experienced the loss of as much as 40% of their population and economic base as factories which could not compete in the new world market were forced to close their doors.

MANUFACTURING DECLINE AND THE INDUSTRIAL MIDWEST

This well documented trend of decline was not confined to Michigan's borders, as the entire industrial midwest experienced similar economic decline. This decline resulted in unprecidented regional inequality, as the cities and regions whose economic bases were derived from services grew, while those cities and regions that were dependent on manufacturing suffered. This pattern served to coin such phrases as "sunbelt/rust belt" and is indicative of a larger national trend. A trend which has resulted in much of this nations GNP being derived from non manufacturing employment.

In the past ten years, the number of manufacturing jobs in this nation have dropped by 38%, and the contribution of manufacturing to the gross national product has declined by 28%(as reported by *Business Week*)(1). This trend poses a threat to the continued economic health of the nation as it appears unlikely that we can maintain our present level of affluence in an economy driven entirely by services. This is especially true given the fact that the barriers to entry in the service industry are much lower than in manufacturing.(2) Hence, an economy driven entirely by services could prove to be even more vulnerable to foreign competition. This fact is the justification for public intervention in industrial policy. Given the danger

of an economic base dominated by services problems of productivity must be addressed

In light of this fact, examination of industrial policy must occur. It is crucial to define the amount and type of intervention by state and local government needed to restore productivity to this nations industrial complex. In an attempt to define the appropriate role of state and local industrial policy the first item to be examined is the proper form of industrial assistance. As many state and local efforts at industrial policy may not address the productivity issue.

TRADITIONAL FORMS OF INDUSTRIAL ASSISTANCE

Historically industrial policy has focused on creation and generation of investment capital. This type of policy is premised on the fact that capital formation in this country has been lagging, a fact which has caused new investment in plants and equipment to decline. According to this argument increased capital formation will result in increased competitiveness, hence we see industrial policy taking the form of tax abatements and bailout loans to industrial giants like the Chrysler corporation.

Unfortunately the link between capital investment and productivity does not appear strong. Consider the plight of Chrysler for a moment. Certainly the capital included in

the bailout plan was needed. But the simple fact that the company was up against the wall appears to be the driving force behind managerial creativity(3). The longer term recovery and success at Chrysler stemmed from improved management on the assembly line. The infusion of capital merely assisted the corporation in weathering the storm.

INDUSTRIAL POLICY AND PRODUCTIVITY

Fundamentally, productivity gains appear to be resulting less from changes in technology and hardware, and more from alterations in management style and goals. These alterations come in the form of reducing the length of the production process, reducing the extent of hurry up orders, reducing the frequency of product changes, creating a more effective factory layout, and recognizing the importance and value of workers' inventiveness and providing opportunities to exercise it(4).

This argument does not intend to imply that pursuing technological advances is unrealistic. Production technologies such as computer aided design, robotics, direct numerical control machines and automated materials handling systems can impact the manufacturing process. Yet maximum gains from these technologies do not occur until the entire system of management also changes. In some applications, studies have shown that new machines can introduce more problems then they solve. Equipment change unaccompanied by

managerial change is potentially counterproductive(5).

When the system for capital allocation at large U.S. firms is examined the weak link between investment and productivity is even more evident A recent study in *Harvard Business Review* revealed that of most large companies, including the big three automakers, 70% do not spend their entire capital budget(6). Therefore, it is difficult to justify how an increased amount of capital would improve productivity at these plants. Once again the massive assistance programs granted by local governments are called into question.

Another reason to question the general direction of manufacturing policy is that all to often this nation appears to be focusing on the creation of new products. Much of our industrial policy comes in the form of incentives and programs intended to generate increased amounts of seed capital or venture capital. While these programs are important and do generate economic growth this type of approach can only enhance the productivity problems(7). When new products are created the manufacturing processes are very flexible and not typically concerned with cost effectiveness. Yet as a product matures the cost considerations in production become paramount.

These problems with product life cycle are best

illustrated by new high tech firms. Many of these firms are extremely careless in their approach to production. Yet, they are so profitable that they can function this way. However, as products standardize and mature the production process takes on increased importance over the product development. It is this relationship that poses the danger for our industrial policy. If we constantly choose to focus on product creation as opposed to process change the results could enhance the lack of industrial competitiveness we are experiencing. The development and production of color televisions are an excellent example of what can happen. At one point the color television was considered a complex item to manufacture and the United States took the lead in this industry. However, now color televisions are considered a commodity, and competitiveness is determined by an efficient manufacturing process. If emphasis is not partially redirected form product development to process change American firms, and the American economy will not gain the full benefits from product development in this nation. Thus, the argument is that U.S. firms do a very capable job of product development, and industrial policy must focus on the weakest link in the manufacturing system, the ability to efficiently and effectively produce these products.

PART TWO

ALTERNATIVES TO TRADITIONAL INDUSTRIAL POLICY

Much can be learned from the Japanese. Examination of their manufacturing processes indicates that improved

hardware is not the key to their success. A survey recently published in *The Harvard Business Review* indicated that most Japanese hardware is old and fairly unsophisticated mainly because it is of high quality and is consistent with the capability of the work force(8). Therefore it appears that the reason our industry has suffered in the world market is not because of a lack of high technology production equipment. The important lesson to learn and hopefully apply to the public policy arena is the fact that the Japanese system achieves high productivity by carefully linking its hardware together, and by carefully managing inventory carrying costs through just in time delivery(9). The Japanese have been able to improve quality, save on maintenance, and use workers more effectively by management ideas not by capital infusion.

INDUSTRIAL POLICY AND TRANSPLANT OPERATIONS

If indeed what is needed is an alteration in manufacturing process one of the best ways to asses the impact of process change is to examine the experiences of the Japanese transplant facilities recently moved to this country.

These firms have taken Japanese industrial theory and effectively modified it to meet the needs of American soil. To better understand the impact of these factories and how their procedures might improve manufacturing processes the

author conducted telephone interviews with management at each of the 5 transplant operations. These interviews were conducted in April of 1989, results and conclusions drawn form these interviews are revealed in the following sections.

In the space of just a few years most major Japanese car makers have opened transplant facilities on American soil. Honda, Toyota and Nissan have been producing cars here for a number of years, Mazda has just opened an American plant and others plan to do so in the near future. It is crucial that this trend be examined as the manufacturing processes and procedures used in these facilities could hold some of the answers that might allow American automobile manufacturing regain its competitiveness.

Consider these facts: Honda's Marysville Ohio plant currently makes more cars than any other single assembly plant in North America(10). By the early 1990's the transplant operations will be turning out roughly 2 million vehicles- one fifth of all cars produced in America(11). More than 200 transplant parts suppliers have followed streaming into this country at a pace of roughly one a week(12). All total these plants employ over 50,000 American workers(13).

TABLE ONE

Japanese Transplants in America

Company	Location	Start	Capacity	Employment	$
Honda	Marysville, OH	1982	500,000	4,200	870
Nissan	Smyrna, TN	1983	265,000	3,300	850
NUMMI	Fremont, CA .	1984	250,000	3,000	850
Diamond Star					
Chyrsler	Normal, IL	1988	240,000	2,900	700
Fuji/Isuzu	Layfayete, IN	1989	240,000	1,700	600
Totals			1,935,000	21,600	4,8701

For transplant manufacturing technologies and practices to be used on a wide scale they must first be understood. Understanding this success has proven to be difficult to understand for most Americans. Many believe that the success of the Japanese rests on conditions many believe to be non-replacable in the United States. Conditions including cultural factors, obedient low wage workers, and very powerful government oversight.

This mystery is enhance by the fact that most Japanese investment in manufacturing has occurred in the industrial midwest-a region that has been discarded by many as a manufacturing center. The central question that emerges for policy makers is how can the Japanese be successful where

American companies have failed, and can their system be effectively adapted to American manufacturing. The next few sections will explore this question. Without doubt the Japanese system of auto production differs markedly from traditional American practice. The Japanese system has advanced beyond the fine grained division of labor found in American auto plants where the organization and pace of work are in effect controlled by the assemble line(14).

Essentially, the Japanese system taps workers' intelligence as well as their physical capabilities in a way that creates tremendous production efficiencies. Table Two summarizes the major differences.

Table Two

The American System versus the Japanese

American System	**Japanese System**
Many Job Classifications	Few Job Classifications
Functional Specialization	Teams/Rotation
Tall Hierarchy	Flat hierarchy
Deskilling	Learning by doing
Separate Quality control.	Continuous Quality Control

The American system in contrast to the Japanese system, revolves around the assembly line. Here individual workers only work on a very limited part of the production process. These very specific jobs are codified in an extensive system

of job classifications that sometimes number into the hundreds which severely limits worker involvement on the shop floor. Also limiting involvement is the strict separation between manual labor and mental labor. Other notable characteristics of this assembly line system are industry wide unions; adversarial labor management relations; arm's length relations with suppliers; and vertically integrated multi divisional corporate organization(15).

THE JAPANESE SYSTEM

In the Japanese system, there are few job classifications. Workers are organized in self managing teams which can rearrange themselves to cope with problems. Workers rotate among jobs, they also do a considerable amount of intermediate quality control, make suggestions on how to improve manufacturing processes and have significant discretion on how they do their jobs(16). For instance, Japanese workers are given the authority to stop the assemble line when problems are encountered, some things which employees of the big three in this country are not allowed to do.

IMPLEMENTATION OF THE JAPANESE SYSTEM

One of the primary purposes of this section is to show that the Japanese system can be effectively transferred to this country. The four operating transplants Honda, Nissan, NUMMI, and Mazda have successfully implemented small numbers of job classifications, work teams, worker quality control and rotation. There are four categories of production workers at Nissan and NUMMI, three at Honda and Toyota and just two a Mazda. This is in comparison to an average of over 90 job classifications at Big Three car makers(17).

Another factor contributing to the likelyhood of transferring the Japanese system is the fact the wages at the transplanted facilities are comparable to the Big Three. According to a recent General Accounting Office study, wages at the transplant assemblers were $11 to start and roughly $12.50 after a year on the job. This is only 50 cents less per hour than pay offered at the big three. Additionally pay is linked to a combination of individual performance, group skills and the overall performance of the plant. Furthermore, the myth of Japanese manufacturing not being transferable to highly unionized workplaces is untrue as NUMMI and Mazda employ UAW members.

In essence, the transplants are able to deliver a competitive product using many of the earlier discussed industrial theories. Given this, is beneficial to examine the intricacies of each operation to better see what elements might be effectively transplanted to other American industries.

Looking specifically at the transplant operations. Recent interviews with plant managers revealed the following:

Honda

Honda has proven quite successful at transplanting Japanese work organization. In contrast to typical U.S. practice where new employees are hired off the street, Honda applicants undergo rigorous screening and evaluation before being hired. According to Honda Management, a more careful selection of employees has resulted in a more capable workforce(18). Furthermore, steps have been taken to cultivate active involvement between workers and management have resulted in greater worker satisfaction, which many believe is a component of high productivity. Quite simply content workers have more pride in their product and do a better job.A series of interviews conducted by *Business Week* at the Marysville Honda facility revealed that 85% of the workers are content with their work environment and their access to management(19). The same survey revealed that

only 60% of the workers at the big three were content.

At the Honda facility Japanese work organization is evident in the way technology is used to enhance human labor rather than control it. Honda assembly lines are engineered to enhance team based work. Quality control begins of the assembly line. This system has resulted in defects declining to a level which is 35% lower than what is experienced in the American plants(20).

New United Motors Manufacturing (NUMMI)

The Nummi experience is of particular importance as this plant is one of the two transplants where the Japanese system is being used with UAW workers. NUMMI is also particularly intriguing as it is located in an old GM plant that was considered to be one of the worst active plants GM had.

A complete restructuring of work organization and labor relations was necessary to bring this plant into line with the Japanese practices. A three way agreement between GM, Toyota, and the UAW reduced the number of job classifications from 200 to just 4(21). A fact that creates more job diversity and higher satisfaction. Satisfaction levels have risen by 60% compared to the original GM facility. The theory at Nummi is that increased satisfaction leads to increased quality as workers exercise

greater concern over the product they are producing.

This facility was also responsive to the needs of its workers in other important ways. Past GM workers were given hiring preference and approximately 85% of the initial work force was composed of former GM workers(22). Furthermore, these workers enjoy the strongest job security of any GM plant. The unions are consulted on many major industrial policy decisions including: layoffs, major investment decisions, changes in productions scheduling.

The transformation of this aging facility has paid high dividends. According to data compiled by John Krafcik of MIT's International Automobile Project, productivity at NUMMI improved dramatically over the old GM Fremont plant; productivity rates are currently about 50 percent higher than any other GM managed plant(23).

Mazda

Mazda's American plant also employs UAW workers. It is located in an old Ford engine foundry in Flat Rock Michigan- an area that has a long history of problematic relations between labor and management. Like NUMMI the implementation of the Japanese system was negotiated up front with the UAW. Essentially the union agreed on more flexible work rules in exchange for preferential hiring of displaced Ford employees(24). In a report on the Flat Rock operation

Richard Hill of Michigan State University indicated that Ford helped sway Mazda's decision to open by providing advice on how to deal with the union. Mazda's Michigan operation includes 6 sub categories compared to 188 for other MI assembly plants. Defects are 40% lower and Satisfaction levels as reported by the General Accounting office have risen to 80% a marked increase from the 44% satisfaction level that was previously reported.

The Key to the success of these transplant facilities is the fact that they are able to organize work to tap the full capabilities of shop floor workers, and at the same time increase quality of the end product by creating a workforce which cares about the product they are producing.

SUPPLIER RELATIONS AND JAPANESE MANAGEMENT

The success of the transplants are not confined to auto assembly. These facilities have also revolutionized industrial supply methods. The Japanese have devised a manufacturing system in which there is unprecedented interaction between supplier and parent(25). This revolution is shown in the table below , and its importance is what will be examined next.

Table 3

SUPPLIER RELATIONS: AMERICAN SYSTEM VERSUS TRANSPLANTS

AMERICAN SYSTEM	JAPANESE TRANSPLANTS
In house production	Outside Sourcing
Vertical integration	Just in time coordination
Dispersed supply pattern	Tiered suppliers
Short Contracts	Long contracts
No involvement in design	Interaction in design
Arm's length relations	Interaction/cooperation

It does little good to have factories using the Japanese system if suppliers are not doing the same. Under Japanese theory manufacturing is a complete system, meaning that manufactures and suppliers workers and management must all be operating under the same ideology. It does little for factories to be using principals of Japanese inspired manufacturing such as just in time and 0 inventory if suppliers are not doing the same.

Therefore, the successful rebuilding of this nations industrial base will require restructuring not only by producers but also by suppliers. This is especially true as automobile manufacturing becomes more complex and requires greater linkages between producer and supplier. For the automotive production system to become more productive

suppliers must adhere to many of the same principal that we have advocated manufactures following.

The theory of Japanese work organization and manufacturing practices have been successful adopted by transplant suppliers surveyed by *Business Week*. Of all the suppliers serving the transplant factories 90% use work teams and have 6 or fewer job classifications(26). Once again it appears as if this arrangement can be effectively transplanted, if it is properly understood.

Implementation of Japanese supplier systems will represent a drastic alteration from current methods of industrial supply used. The Big Three have traditionally kept the bulk of their manufacturing activity in house and dealt with suppliers on a purely arms length basis. GM for instance produces roughly 70 percent of its own parts while Ford produces about half of its parts(27). In contrast the Japanese supplier system accounts for more than 70% of actual vehicle manufacturing(28). Japanese auto makers also prefer long term stable arrangements with one or two suppliers as opposed to the typical American system of multiple sourcing. Suppliers are located close to major assemble plants so they can deliver parts according to "just in time" inventory requirements. They are organized in a tier system of primary, secondary and tertiary suppliers(29).

Specifically, the primary suppliers have an especially close relationship to assemblers. They help to organize the supple process, delivering completed sub-assemblies to assemble plants, and frequently work with car makers to develop new products. The parts people are the ones who know their product best and can therefore comment most effectively about its contribution to the automobile(30).

Once again, the transplant facilities in this country have shown that the Japanese supplier system can be used in this nation. The Honda facility illustrates this. An interview with a Honda executive indicated that the great bulk of deliveries conform to "just in time" inventory requirements. For example, Honda seat assemblies are ordered by computer from an adjacent Japanese supplier just as cars start down the line(31).

The type of interactive supplier relationship holds true in the other transplant facilities. NUMMI for example worked with an American Steel manufacturer, LTV for six months to improve the quality of its steel. Honda engineers developed new production techniques for a small Ohio plastics firm that became a Honda supplier. Honda intends to use its Marysville R&D center to integrate both transplant and U.S. suppliers into the design of its future cars.

Additionally there are tight linkages between transplant assemblers and suppliers. Nearly 80 percent of the suppliers recently surveyed by *I.N.C. Magazine* conform to just-in-time delivery requirements. 40 percent are located inside a two hour trucking radius of end users(32). Furthermore, this survey revealed theat assemblers and suppliers interact quite frequently and commonly engage in joint problem solving. More than two-thirds said they participate closely with assemblers in the development of new products.

LOCATIONAL CHARACTERISTICS OF TRANSPLANT OPERATIONS

The American Midwest is the site of a series of expanding industrial complexes. These are anchored by assemblers and include parts suppliers, steel manufactures and rubber companies. As appendix one shows dense supplier networks surround each of the midwestern transplants.

Furthermore, according to appendix two, the midwest states of Ohio, Michigan, Indiana, Illinois, Kentucky, and Pennsylvania are home to more than three quarters of the transplant suppliers. In fact aside form California few transplant operations are located outside the midwest

Executives interview at the Honda facility indicated

that distances between suppliers and parents in the United States are typically longer than in Japan. The less crowed U.S. landscape allows suppliers to locate 20 or 30 miles apart from one another, therefore minimizing competition for employees(33). In essence the United States may prove to be better suited to the Just in time supplier relationships than is the densely crowed industrial landscape of Japan(34).

This argument is designed to show that the industrial theory behind the transplant operations is a valid one to transfer on a larger scale to other segments of our industrial base. When considering policy options to promote this process it is helpful to look at the policy decisions that have been made with regard to the transplants. As many of the dangers and difficulties of industrial policy are revealed and therefore can hopefully be avoided in the design of future strategies. aimed at transplant operations.

ECONOMIC DEVELOPMENT POLICY AND TRANSPLANT OPERATIONS

These transplant facilities have increasingly become a target of state and local industrial policy. According to a study by the International trade commission, states in the transplant corridor have already provided more than $500 million in financial assistance to help Japanese car makers acquire land build roads and train workers.(35). A figure

that rises considerable when indirect assistance like tax abatements are considered.

Researchers at the University of Kentucky document an alarming trend of escalating public subsidies to transplant auto makers. During the last few years the amount of subsidy per worker has risen dramatically. At Nissan subsidy per worker is now $13,850 up from $11,000, at Mazda the amount is $33,000(36). Rational economic development policy must be enacted to prohibit these costs from rising further.

Additionally, Americans must overcome the desire to instantly assign a negative to anything Japanese. Quite simply Japanese auto mobile investment represents an opportunity to rebuild a portion of our manufacturing base. The Japanese did not cause our present industrial woes, and rather than instantaneously viewing their procedures as negative we should instead learn what we can and strive to rebuild our capacity to produce. We must also resist the temptations of interjurisdictional competition. Economic developments must resist the temptation to be overgenerous in their attempt to lure transplants and their suppliers. At present most Japanese industrial investment has been in the heartland and there appears to be an implicit policy of spreading the operations through a variety of states. An effective approach in light of this might be to develop a

regional task force of the transplant states that could develop a united front and cause future negotiations with the Japanese to be less costly and more productive. Lastly above all these transplant operations should be a learning tool for other operations in our manufacturing economy. Economic development officials can use the transplant experience to assist large and small companies at the state or local level to accomplish he kinds of organizational restructuring to make them more competitive. Assistance could be given to implement things such as work teams, rotation, greater employee involvement in decision making and increased labor management cooperation. Essentially the planning challenge is both economic and political, as the economic gains of the transplant facilities must be implemented in a way that does not heighten fears of a Japanese invasion.

JAPANESE INDUSTRIAL POLICY/MANAGEMENT-CONCLUSIONS

Clearly the arguements and analysis presented above while importatnt is not entirely new to those in the planning and policy arenas. From the early 1980's when the Japanese auto makers first made a significant impact on the U.S. market, Japanese management techniques have been in vogue and often at the forefront of the public policy arena. However, what is of critical importance is that to be

successful japanese management principals (Just in time, zero inventory etc..) must be part of a complete manufacturing system that recognizes the needs of suppliers, as well as assemblers and primary manufactures. Furthermore, this analysis has shown that the midwestern United States is the region of the country that is perhaps best suited to the principals and policies discussed. Unfortunately these finding contradict many of the actions taken by America's manufactures as they continue to keep supplier relations at an arms length basis. In fact, a 1989 study published by the Materials and Logistics Management Department at Michigan State University revealed that among automobile manufactures in Michigan Ohio, and Illinois, improved supplier relations were the most underutilized means to improve productivity and quality(37). Additionally, in many instances a midwestern location has not been maximized as the supplier network has not been fully tapped. The MSU study indicates that 70% of the industrial operations surveyed were producing components internally that could be obtain at less cost from an outside supplier(on aveage 30% less)(38). The central issue thus becomes one of causing those with decision making power to realize both the potential advantages of an integrated manufacturing system of suppliers and assemblers, and the potential advantage of a midwestern location. In light of this, attention will now be turned to potential local policy applications of these manufacturing techniques.

STATE AND LOCAL ALTERNATIVES

One of the best examples of an alternative approach is a system used in the State of Georgia. Several years ago the Georgia Department of Industry and Trade when faced with a budget crisis conceived a program aimed at the process side of the state's manufacturing industry. The program known as Good Cents reduced the amount of state funds going to abatements and loans and rechanneled these monies into workshops on process change. The state was able to utilize resources in engineering and business found at Georgia State University, The Georgia Institute of Technology and the many Japanese transplant industries that had relocated in the state.

The actual operation of the program went in the following way. In order to receive state assistance a firm was required to participate in one of the instructional sessions that the state provided. Furthermore, the Universities and the Japanese businesses received extremely favorable financial treatment from the state for their participation in the program. Incentives were also given incrementally, rather than all upfront. Essentially a system of merit pay was implemented by which firms were rewarded with state assistance when new productivity programs were in place, or when state established

productivity goals were met. Participating firms were rewarded for increased productivity. Granted, administration costs of such a program are high, yet in Georgia the net dollars given in industrial assistance have been reduced, while productivity has increased at the 100 firms who have participated in the first 4 years of the program(39).

This type of approach could have merit in other industrial states such as Michigan. In the Georgia example the most significant gains were witnessed in existing, aging facilities(textile mills and light manufacturing facilities). Thus this type of incentive could be conceptually applied to Michigan's aging manufacturing industries.

This shows but one example of how industrial policy can take other forms than the traditional capital driven ones. If a creative approach is taken governments can have a positive impact on the productivity side of the manufacturing process, which is where the problem may lie.

Thus, it appears as though the revitalization of manufacturing can occur if emphasis is placed on improving the manufacturing process. Given this, attention will now be localized once again as the state of Michigan will be examined to determine how the states resources can be

channeled in a way that fosters an improved manufacturing process.

PART THREE

JAPANESE INDUSTIAL POLICY AND MICHIGAN'S REINDUSTIALIZATION

HISTORY OF MICHIGAN'S EXPERIENCE

The severe economic downturns of the early 1980's have clearly prompted the need in Michigan for this change. The leaders of this state must recognize that the success of industry and that of the state are intertwined. For several years now the state of Michigan has contemplated a response to the fact that every facet of the United States automotive industry is racked by revolutionary changes. The drive to achieve and maintain leadership in quality productivity and sales has to overturn basic practices and upset fundamental policies. More specifically this internationalization of the automotive business and maturing free world markets are spurring far-reaching changes in management and organizational philosophy, labor management practices, and supplier-manufacturer relations. Michigan must respond.

SOLUTIONS

As was outlined in earlier sections, new managerial philosophy must be the driving force behind efforts to enhance this state's. automotive industry viability in an increasingly competitive environment. Most importantly, revised management thinking precedes and underlies other

developments.

It is clear that Michigan's automotive industry must choose to compete in the world environment. The industry's commitment has important geographic ramifications. The growing importance of information communication and closer supplier relationships as well as the pragmatic need to reduce inventory at all stages of production, underlie a major trend back to a regionally centralized industry, a trend which can benefit a state like Michigan. Michigan is the heart of the Great Lakes industrial complex. Michigan plants enjoy a strategic location from which to serve both retail and manufacturing customers. A 500 mile interstate truck haul from Lansing Michigan can reach 48 percent of the retail sales and 53 percent of the value added by manufacturing in the United States(40).

Furthermore, because Michigan is the hub of North American automotive production, the factories of the state are a huge internal market for auto suppliers. During 1983 alone, over 17 billion worth of materials parts and components were purchased by the Michigan facilities of General Motors Ford Chysler(41). This type of success results in jobs and tax revenue for Michigan citizens and communities. The advent of just in time production methods in the auto industry have now increased the logic of a Michigan location for suppliers who value their automotive

market. U. S. auto makers have to launch a continuing campaign to eliminate all waste form their operations. Major savings are anticipated from better management of material flows throughout the entire chain of supply in the industry. The auto companies will require that their vendors make more frequent deliveries in defect free smaller lots. Michigan, with access to technology steel rubber and other essential automotive components is a logical just in time location(42).

Many, including officials at the Michigan Department of Commerce who have primary responsibility for articulating Michigan's strategic vision for automotive recovery would argue that the concern over restructuring the states automotive manufacturing is not needed. Assertions are made that the state is actively engaged in a restructuring of the auto industry. Supporters of this claim would present the following argument as examples of this restructuring

Corporate innovation - Michigan's automotive machine tool and general metal working enterprizes have generated many private sector research development and scientific testing facilities across the state. Ford's Central Research Operations in Dearborn is complimented by facilities specializing in glass technology and coatings as well as by the Robotics and Automated Applications and Consultation

Center in Dearborn. The General Motors Technical Center in Warren Michigan is a world center of automotive research and development. Chrysler's developmental activity is now concentrated at its Manufacturing Technology Center in Auburn Hills. All together the big three have invested nearly 200 million additional dollars in industrial innovation during the past three years(43).

The emphasis on creating a technologically advanced product is not confined to the automakers themselves. There are many intrinsic factors that lead to this technologically based solution. Michigan leads the nation in member of the Society of Automotive Engineers and the Society of Manufacturing Engineers. Both organizations have become active in conducting frequent educational activities in the state . Additionally Michigan's strong university system provides a steady pool of technically grounded graduates and is a center for basic and applied research. Furthermore, the keystone of Michigan's campaign to lead the nation in transition into advanced manufacturing technology is the Industrial Technology Institute. Private foundations and the state government have worked together to found the institute which conducts basis research on advanced industrial automation. The institute is also active in supporting the needed partnerships between the builders and users of advanced technology so as to support and encourage the engineering, production and support of automation

equipment in the state.

Those who claim the industry in on solid ground and ready of the challenge of the world market would also cite the fact that essential support services are also provide and touted by those engaged in the reindustrialization process. These support services include Media support, advertising, testing labs, consultants, and computer companies.

Essentially those who subscribe to the belief that the state is properly prepared to be a leader in the automotive industry subscribe to a highly technologically based solution to Michigan's past problems in the industry. This solution however is not comprehensive as none of the steps taken effectively address the need to improve productivity. As has been demonstrated, productivity, and quality are far more than technological improvements. The Michigan strategy to date fails to address the need to improve the entire manufacturing process. The strategy used in this state also does not recognize that one of the most important premises of successful Japanese manufacturing theory is the realization that manufacturing is a system of suppliers and primary manufactures. Unfortunatly, this concept of a manufacturing system has yet to be at the forefront of the Michigan's strategy for industrial recovery. At the end of Governor Milikin's administration decisions were made to

redirect primary emphasis away from the automobile industry and toward high technology industries including bio-technology firms, and advanced electronics. This decision has made industrial recovery that much more difficult as long term neglect of the network of auto manufacturing suppliers will be difficult to quickly remedy.

Specifically, to effectively utilize the geographical advantage, Michigan must placed increased emphasis on suppliers and their needs. The state, and the Department of Commerce has to realize that this is a challenging period for suppliers and recognize a public purpose in preserving and broadening the strong supplier support found in the state. As these suppliers not only assist the automotive industry but they also can represent a powerful tool for economic development A program similar to Good Cents in Georgia could be implemented to help encourage the smaller less capitalized supply firms improve their manufacturing process.

Over time a rich network of Michigan vendors could potentially grow up. This accumulation of abilities knowledge and trust would help make firms profitable. In any industrial area of the state a manufacture can pick up a phone and talk to firms minutes or hours at the most away. This can keep the bottom line in order.

The supplier network holds part of the key to the revitalization of Michigan's automotive industry The second key is the labor force Michigan's labor force in the auto industry is in transition, it could serve to be a tremendous strength or a tremendous weakness. Michigan has a large pool of available workers to meet the needs of modern automotive manufactures and suppliers. The state's labor bank must be viewed as a renewable resource. This labor force is potentially renewed by the thirty community colleges and technical schools that are able serve manufactures in virtually every region of the state(44).

Given the afore mentioned principals of successful manufacturing process change Michigan must take the following steps to assure competitiveness:

1. the state must realize that productivity improvements are the key to increased competitiveness and long term growth of the industry. The state must also realize that the linkage between capital and productivity are not directly related.

2. The state must realize the potential advange it has interms of its supplier network. Emphasis must be placed on developing it, and venture capital efforts by the Department of Commerce must be redirected to include assistance to new

automotive supply firms.

3. The state must strive for transplant partnerships.- To date the transplant operations represent some of the most productive and competitive automobile manufacturing operations in the world.

4. The state must strive for improved labor management relations. Ultimately the workers will be one of the main cogs that can lead to increased productivity and at present there is a danger that perceived difficulty in in negotiating with workers is driving industry to other states.

5. The state must effectively transmit this message to the leadership of the big three. Until there is a commitment at the top of the organization change will not be effected at the lower levels where some of the most profound effects on productivity and quality can occur.

SUMMARY OF FINDINGS

This research has attempted to look for solutions to the well documented productivity problem in Michigan and the industrial midwest. In light of the acclaim the Japanese industrial techniques have received extensive interviews were conducted with management at the transplant facilites so that the Japanese theory can be more effectively adapted

to this nations industrial base. Highlights of this research include:

* This state's industrial difficulties are largely caused by a capital intensive production process that often places more importance on product development that production processes. More balance is needed between the two.

* An important component of improved productivity lies in tapping the full ability and intelligence of workers. Satisfied workers produce more effeciently, and quality is enhanced when it is monitored on the assembly line.

* Improved productivity can result from better intergration of manufactureres and suppliers. This concept of a manufacturing system has been frequently ignored as manufacurers often produce components in house that could be obtained at less cost from outside.

* Improved productivity often can be derived from a change in the way management approaches industrial problems. Historically too much emphasis has been placed on new technology at the expense of recognizing the value of properly linking and structuring existing equipment.

* Improved productivity can be derived from changing the way that government approaches industrial policy. Historically too much emphasis has been placed on providing capital to manufactures, with emphasis on lowering costs

rather than improving productivity. Capital must be more accurately aimed at improving industrial productivity, as such an improvement will yield more jobs, investment and GNP.

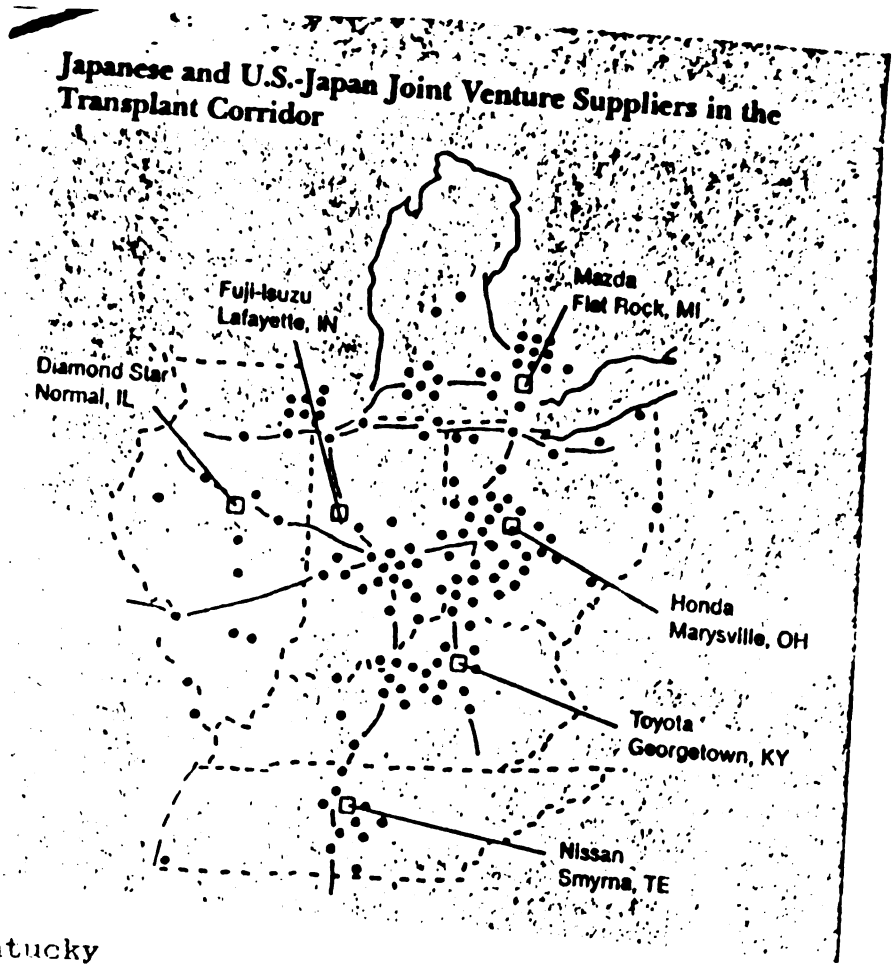
CONCLUSIONS

This analysis of the future of Michigan manufacturing is both encouraging and discouraging. It is encouraging from the standpoint that the transplants have shown that industrial process change can have a profound impact on quality and productivity. It is discouraging form the standpoint that significant change in these areas may only result from changing the ideology that the management of America's manufactures adheres to. This ideology is difficult to access as those in government frequently do not have necessary influence and access over the Roger Smith's and Lee Iaoccoa's of this nation, and therefore the ideology will be potentially difficult to change.

The potential difficulty in changing this ideology is effectively illistrated by the following data: In 1988, the president of Mazda motors reports earnings of slightly more than $120,000 per year. A similar executive at an American company would report earning in the millions. This basic fact hints at the larger problem which is one of access and responsiveness of senior management to actual operation of the manufacturing assembly line. In America a senior

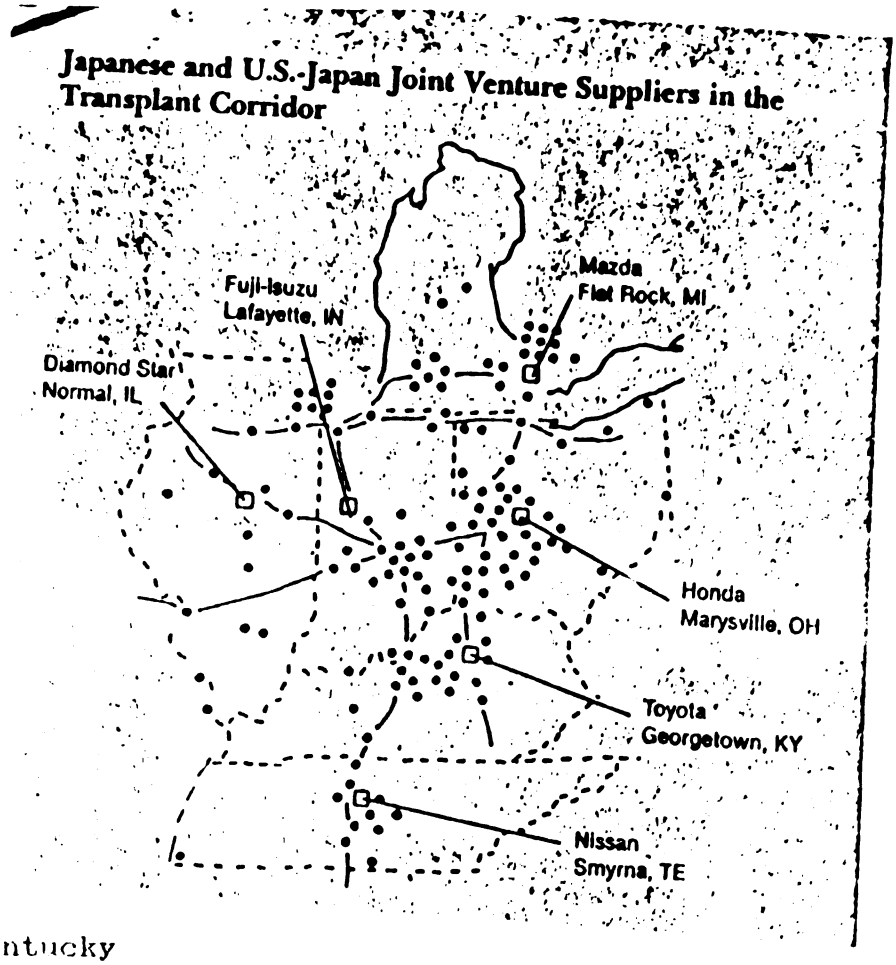
executive earning a million dollar salary has little incentive to be in touch with the day to day operations, despite the fact this is where many solutions to productivity and quality problems may lie. Furthermore, the distance between management and workers can cause alienation which reduced productivity and quality. Therein lies the public policy challenge in the manufacturing arena. Despite the apparant logic of many Japanese ideas how can they be effectively implemented if the management who creates the strategic vision for the company is cloistered from the day to day operation. In light of this the challenge to those in government pertains to how can the fundamental assumptions that have governed manufacturing be altered by public policy in a way that moves away from the traditional capital based strategies.

APPENDIX ONE



Source: State Of Kentucky

APPENDIX ONE



Source: State Of Kentucky

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