

The Rise and Fall of America's Productivity

An Honors Thesis (ID 499)

by

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Less than twenty years ago, the United States enjoyed the best of all possible worlds. It possessed the ideal combination of low unemployment rates, low rates of inflation and rapid economic growth. But since that time, the economy has been plagued by the opposite combination--that of persistently high unemployment and inflation rates and inadequate expansion. Although it would be unfair and incorrect to say that a single factor has brought on this reversal of trends, one point can immediately be brought to center stage: The growth of productivity has slowed dangerously since the economically well-adjusted Sixties.

The purpose of this thesis is to examine in depth the decline of U.S. productivity. It will attempt to probe for underlying causes of this unfortunate state of affairs, (involving both physical capital and human capital problems,) and offer some possible solutions.

To some policymakers the productivity sag is even more important than the problem of inflation, since slow growth in productivity gravely contributes to rising prices. It is for this reason, and my personal concern on the need to restore the U.S. to its position of productive leadership, that I find this topic so critical.

From 1948 to 1968 output per hour worked increased at an annual rate of 3 2%. But from 1968 to 1973 the annual increase came to 1.9%, and over the next six years the rate fell to a miniscule 0.7%.<sup>1</sup> Economists have for the most part blamed the poor American showing in the area of productivity on three factors. They boil down to lagging outlays in research and development, a lack of capital investment, and the upsurge in costly federal environmental and safety regulations.<sup>2</sup>

The first of these--sagging spending for R&D--has slowed the rate of laborsaving innovation in United States industry. The innovations we do develop are often used suboptimally. For instance, the introduction of computer technology has led to a quantity jump in the amount of information supplied to management, a lot of which is unnecessary. Too many people are paid simply to move massive stacks of paper from one pile to another. Michael Sanyour, president and chief executive of Wofac Company, a division of Science Management Corporation, says,

"What really happens is that most companies end up with more people in addition to more hardware."<sup>3</sup> Incidences such as this serve to make R&D appear useless.

It may be helpful to look back to when the investment in R&D began to take place, and note why this trend appeared. It seems to have started in the late Sixties when our previous investments in research and development did not seem to be paying off as we had hoped they would. Technology did not appear to be producing the productivity increases expected of it, and so it received a sizeable portion of the blame when we passed through a period of disillusioning annual productivity increments. People expressed great uncertainty about technological undertakings. Experts seemed to take the position that the spectacular improvements in our productivity in earlier years had been the consequence of many years of devotion to technology and had run their course. They felt that we had arrived at some sort of plateau. They predicted that necessary future improvements in productivity would have to come from somewhere else besides technology. More recently, this opinion has changed; the general uncertainty about technology has moderated somewhat.

C. Jackson Grayson Jr., an authority on wages, prices and productivity feels some productivity gains can be made in every industry. "If an industry can't improve its output, it will have to go out of existence. It won't be able to meet competition from more efficient producers."<sup>4</sup>

It has been said that the most crucial factor in the creation and utilization of our technology is the decision to do it. This decision to invest in research, to go ahead with the development, and to install equipment is so much a matter of uncertainty, ambiguity, complexity, and the possibilities of both big gains and big losses, that it severely challenges the habitual style and skills of the decision makers involved.<sup>5</sup> Yet so much depends on this decision, that it must be made.

Industrial research and development has produced some huge successes--but, unfortunately, they have been accompanied by a multitude of failures. One study of 80 companies found that only one out of forty new ideas survive the organized development process."<sup>6</sup> But overall, it is certain that R&D makes for technological progress which translates into productivity improvement. It would seem, in the long run, that there would be a relationship between the amount a firm spends for R&D and the total number of significant technological advances it produces, given they have high-quality professional personnel. The ability of management is very crucial, for they are responsible for selection of projects to support and projects to terminate.

Some have called for greater risks in research budgeting and some for less. Taking greater risks will most likely reap fewer successes, but those ventures that do

succeed will probably be superior. With lesser risks taken, we will probably have more successful research projects, but the success will be of lesser importance. In essence, we would be making a myriad of tiny innovations which may be too small to increase productivity.

David Kearns, president and chief operating officer of Xerox Corporation is an advocate for taking more risks. He does not think that the age of innovation has come to an end. He feels that the wealth of the U.S. is not so much in our "abundance" of natural resources, rather it is in our minds. It is our infinite supply of ideas that can pull us through if we were only willing to try them out. "With the technology we've developed, we can revitalize our tired industrial machine and restore it to its rightful place among our competitors,"<sup>7</sup> concluded Kearnes.

Echoing Kearns view, is Melvin Verson, chairman of the National Machine Tool Builders' Association. He stated that, "In the past, when things looked gloomiest it has been the entrepreneurial spirit of American businessmen that has resulted in the risk-taking that has pulled America through and made her stronger."<sup>8</sup>

A factor that is a large contributor to R&D failures, is our resistance to evaluate R&D decisions after they have been initiated. By looking at the outcomes of our R&D projects, we can learn a great deal about the value of our decision processes. That is, we should be careful not to

fall into a "win some, lose some" attitude. Instead, we should seek to discover why we "lost some"... Gradually, the disappointing results of past R&D efforts have led more and more organizations away from a willingness to make the crucial decisions on the basis of unexamined judgement or intuition. Uncertainty should be explicitly expressed so that R&D policies can take an accurate account of both potential benefits and the associated uncertainties.

Although technology is a very important key to increasing productivity, the reactions of workers to the technological change is equally important. Nothing is more fundamental in determining the productivity of our technology than the view of those whose decision is to utilize it or not, and the view of those who operate it, live with it, and make their living in daily association with it.<sup>9</sup> Some workers may fear, with some degree of justification, that new technology may eliminate the need for their job. In this case, they will oppose R&D from the standpoint of maintaining job security. The attitudes and problems with workers will be discussed later in this paper.

The second of the factors blamed for our nation's slow growth in productivity was the lack of capital investment. Capital investment is needed to purchase more productive and efficient equipment and expand plant capacity.

Between 1948 and 1973, business spending on new plant

and equipment added 3% a year to the capital investment supporting each man-hour of work. Since then, this capital-labor ratio has increased only 1.75% annually.<sup>10</sup> This means that businesses are hesitating with their additions of cost- and labor-saving machinery. There are three major areas of managerial decisions affecting productivity and technology. These include modernizing existing plants through the purchase of new equipment and facilities containing technological improvements, building new plants that can take advantage of economies of scale, and establishing longer-term R&D programs that search for advances in products, processes and production equipment.

The modernization programs would entail less investment than new plants and would probably offer moderate rewards to come closer to catching up to technologically superior competitors. But, its often found that the restraints of existing facilities often hinder attempts to reduce the technology lags.

Building new plants that already contain the major advances of competitors would require bigger and longer investments and more risks. But, if they are successful, these new plants could catch up to the current technology of competitors. By doing so, this plan of attack would offer higher rates of return than modernization projects.

Long-run research and development programs usually

involve even greater risks than the first two cases, but they also offer much greater and longer-lasting competitive advantages to the firm that undertakes them.

There are several deterrents to undertaking capital investment, one of the most powerful being the excessive emphasis we place on short-term profitability. Management often sacrifices long-term wealth maximization to obtain this short-term profitability. They take one look at the high costs and risks of long-term research and the construction of large, innovative production facilities and then overlook the possibility that these costs may be recouped many times over if successful. The short-run view of profitability has encouraged concentration on projects which can be completed more quickly and which involve relatively smaller financial commitments--rather than to face the chance of declining profitability over an extended period as increasing resources are absorbed into long-term undertakings which yield no additional revenues until some come to profitable form.<sup>11</sup> For building large, new plants which contain innovative technologies, short-term views make it harder to obtain needed financing, since most of the payback won't be in a few short years.

Sony chairman Akio Morita agrees that there is too much emphasis in the U.S. on the short-run. However he thinks management's fear of sacrificing his profit to his successor is the overriding consideration, rather than the fear of project failure. Morita states, "The annual

bonus that some American executives receive depends on annual profit, and the executive who knows his company's production facilities should be modernized is not likely to make a decision to invest in new equipment if his own income and managerial ability are judged based only on annual profit."<sup>12</sup>

Before leaving the topic of capital investment, an up and coming trend in plant additions should be mentioned. One of the major plant additions in the near future will be the robot. "Robots and other computer-aided automation are essential if industry is to increase productivity and enable the U.S. to compete more effectively with Japan and West Germany."<sup>13</sup> In several industrial jobs, robots have the edge over humans. They can perform repetitive, boring motions and work under harsher conditions while maintaining greater accuracy than their human counterpart. They don't demand wage increases, take long lunch hours, or threaten management with strikes. The fact that robots can maintain greater accuracy on the job brings the topic of "quality" into the picture. Although the robots cannot "care" about the product they turn out, they can be programmed to produce quality products consistently. This is not the case with human workers-- they often do not take pride in their workmanship. The number of defective products on the market today and the growing amount of worker absenteeism reported lend themselves to this point. We must somehow instill our workers with a quality concern as well as seek to improve quality control measures.

The third factor that contributes to our stagnated productivity is the over-abundance of federal government regulations, which often handicap plant efficiency. One study showed that we have lost almost one fourth of our productivity gains in recent years as a result of industry's need to invest huge sums to meet pollution-control and environmental standards, and safety and health rules.<sup>14</sup> These dollars spent complying with regulations could have been channeled into purchasing productive equipment and developing more efficient operating methods. Environmental pollution controls represent one of the important sources of deterrents to advancing productivity. The negative results of these regulations don't arise from the principle of reducing pollution, but rather from the level of the standards set, the speed of required progress, and the methods of implementation. Since it's obvious that pollution controls will divert some investment from programs to increase productivity, (which embody improvement of industrial competitiveness and associated employment and income levels) the question becomes how much of this diversion is desirable? In the February 19, 1979 issue of Forbes it pointed out that GM was at that time spending \$1.1 billion a year on meeting government regulations--which is the equivalent of 23,750 full-time employees out of GM's total employment doing nothing but working to satisfy the demand of public interest groups.

Although a clean, healthy environment benefits each of us, we must recognize the need to remain competitive with other major industrial nations--these two ends of the continuum must be weighed and their worth evaluated. One method of solving the pollution control dilemma would be to set standards and impose stiff fines for violations, but leave it up to the industry to decide the cheapest way of implementing them.

Another deterrent derived from pollution controls is the long, drawn-out, and costly process of analyzing and evaluating the environmental impacts of new plants. Delays of one or two years, and even longer in some cases,<sup>15</sup> combined with additional outlays for special studies may make new plants hesitant due to the risk of being forced into bankruptcy from meeting expensive pollution-control requirements.

Another example of government deterrents to innovational efforts is seen in the area of patents and anti-trust policies. Presently, large companies who are often the most capable to conduct the R&D necessary to develop advanced technologies, face the threat of having to make their major successes available to competitors. In essence, patent policies, which were originally intended to encourage technological advances, are resulting in the opposite effect. So to counteract this effect, protection must be strengthened for both big and small firms by removing the disincentive of being forced to share tech-

nological advances. One of the important sources of improved technological capabilities in recent years has been increasing the size of operating units to take advantage of economies of scale. The increased size, though, would create dominance in many industries by a small number of firms. In other countries, attempts to employ potential increases in efficiency and competitive advantages have been actively supported by their governments. This has not held true in the U.S. In the United States, our commitment to maintaining competition has led to discouraging concentration with the result of lesser efficiency.

Another government deterrent that has been under attack is foreign trade policies. "The U.S. needs to recognize the importance of exports in today's global- and highly competitive environment. We must establish fair and equitable policies that will allow Americans to compete in the world marketplace."<sup>16</sup> At the present, we are saddled with subsidized exports to the United States and foreign refusal of equal access of U.S. exports to their domestic markets. One step the government could take here would be to strengthen federal enforcement of anti-dumping laws. Tariff penalties might help protect private enterprises in the United States from unfair competition by imports relying on government subsidies not available to domestic firms.

The purpose of efforts such as antidumping laws

and tariff penalties would not be to discriminate against imports on the basis of lower wages abroad as is commonly assumed. On the contrary, one of the main reasons for improving domestic technology is to permit our labor force to compete with such imports by raising productivity levels enough to make higher wage rates feasible. However, direct restrictions should be considered against imports from countries which apply direct or indirect restrictions against U.S. exports.

An article appearing in the June 16, 1980 issue of Fortune discussed the use of tax cuts to encourage businessmen to spend more on new plant and equipment. (The term "supply-side economics" encompasses this idea.) It sees capital spending as having been restricted because the tax deductions companies can take for the depreciation of their assets are unrealistically low. A bill has been proposed that would allow for faster write-offs for most assets, which could help compensate companies for the higher costs they would be facing once the equipment really did wear out.

Dale Jorgenson, a Harvard economics professor criticizes this bill, though, because its based on historical costs (which don't reflect rising inflation) and because it gives corporations incentives to buy assets that maybe do not even result in notable increases in productivity. "A businessman should spend his money for the maximum increase in efficiency, and not just to take advantage

of a new tax wrinkle."<sup>17</sup>

Thus far, this paper has focused primarily on machine-intensive productivity improvement strategies... at this point, I would like to consider declining productivity from the people-intensive side.

Since productivity is measured by "output per man-hour" a careful look at the workers supplying this labor would be prudent. The Bureau of Labor Statistics reported that output per man-hour has been rising at a rate of about 3.2% a year since World War II, but currently the figure is less than half the long-term rate.<sup>18</sup> Although management agrees that improving output is important, they often have no explicit program to accomplish it. Management inattention to the problem must be addressed. "Deep in his gut the American manager thinks people aren't important to productivity, that its just a question of more capital or new technology. He's got to learn that people are the key and that we've got to unleash the untapped talent of workers."<sup>19</sup>

Some blame union-imposed work restrictions for lagging productivity. Unions impose bogies--which forbid capable workers from surpassing a certain level of output. (Peer pressure, as well as threat of physical harm, induce workers to abide by these bogies.) Their purpose is to prevent unusually gifted workers from making co-workers appear inefficient or lazy, and also to prevent management from making the high output of a few into standard output for all. Sometimes, especially after technolo-

gical advancements, the bogies become unrealistically low.

Its obvious that the blame cannot be completely assigned to either management or workers. That is, productivity has become a joint problem that must be conquered from both sides.

There have been several theories attempting to explain the worker's viewpoint on the importance of work, and what incentives best induce him to work harder. But, these theories often forget to note the differences in worker preferences. Some workers consider job security most important, while others may care most about how much money they make.

In a 1973 survey of 2,535 sewing machine operators, job security overwhelmingly was rated most important; rated above "pay equal to other plants," "more fringe benefits," and far above "meetings to talk about how work is done and how it could be done differently."<sup>20</sup> These operators would obviously oppose technological advancements that would increase productivity for fear of being displaced from their jobs. Labor unions continue fighting for job security by opposing anything that tended to increase productivity; winning work rules and time off which tended to reduce productivity; and holding on to contractual agreements which often made it harder to increase productivity. In today's competitive environment, firms can't afford to employ non-productive workers. Labor is always looking for "more", but if they want to attain it

they must be prepared to work for it. "If an incremental worker doesn't produce any more goods than the average existing worker, there won't be any gains in efficiency out of which to finance a higher standard of living."<sup>21</sup> To attain a better standard of living, people must become more efficient, absenteeism must go down, and we must get the most out of technology.

Management should refuse to grant multi-year labor contracts with automatic wage increases that are not tied to productivity increases. Paying for work not produced does nothing but add to inflation.

Businesses and government may be able to step in to help reduce the worker's fear of maintaining job security. Perhaps they could offer retraining opportunities for younger employees and reasonably attractive early retirement terms for older employees. Displaced workers might also be guaranteed preferential consideration for any new job opportunities brought about by the technological advances.

In general, workers do not see their interests coincident with those of management. They see themselves as being asked to trade an almost certain short term sacrifice (work harder) for an uncertain long term gain (an increased standard of living.) Besides, productivity always seems to increase for the economy as a whole every year--so why should any individual worker be expected by management to take unusual risks while productivity goes right on increasing without his help? In response to

this conflict of interests, Sony chairman Akio Morita stressed that "Good management is the key to good management-labor relations."

In Japan, when a worker is hired, a responsibility of lifetime employment is bestowed upon him. Even in times of economic downturn, they are reluctant to impose layoffs, for the Japanese place high priority on employee relations. Workers are put into training programs, or asked to fill new jobs in the plant created for them. This investment in human capital is wise, for economists have shown a positive impact of education on increased productivity.<sup>22</sup> When the economy picks up, the increases in productivity from better training and high morale should compensate for the cost incurred while keeping workers on the payroll.

In addition to improving management-labor relations, management should take a good look at the production process itself. "Fully 30% of a workday is lost, through scheduling problems, unclear communication of assignments, improper staffing and poor discipline."<sup>23</sup> This implies that a major factor in enhancing productivity entails simply ensuring that the work is laid out in the most effective fashion, the procedures for doing the job are efficient, proper tooling is available and that workers have the equipment and personnel support that they need to be most efficient.

One of the basic improvements that can lead to a more

efficient work flow is the process of streamlining the organization. Smoothing the flow can enable the organization to function in a more productive manner. As the economy has increased in complexity, managers have too often tried to cope with problems by adding unnecessary activities, and inflated titles to the organizational pattern. As Hornbruch states in Raising Productivity, "An organization is much like a fruit tree. If ignored, it develops branches and leaves abundantly but doesn't produce much fruit." The firm should not overstaff--there should be both a functional and economic reason for each position. The number of levels in an organization has an important impact on its productivity, because the more levels the more cost. Not only are there added payroll and fringe benefit costs, but also the cost of "slowness" from going through all the channels. Also, the more levels information must filter through will produce more discrepancies from the intended message.

Once the organization has been streamlined effectively, management-labor relations should be improved through the sharing of information and communication in an atmosphere of openness. Employees should be encouraged to feel a sense of responsibility with regard to their decisions and their performance on the job. This sounds simple and straightforward enough, but its often hard to overcome psychological barriers among management to having workers participate in decisions. "Management is terrified that it will mean giving up control to the

workers,"<sup>24</sup> claims Theodore Mills, director of the American Quality of Work Center in Washington. But it has been shown that workers respond best to programs that they help create and understand.

The concept of increasing the employee's control over the work situation provides him with more discretion about how a job is to be done. Unnecessary constraints are removed as much as possible. Flexitime may be used to give the worker greater freedom in determining his work hours. An example of a program used to aid worker's understanding of the goals of the firm is that of Management by Objectives. It tries to plan future results by involving managers and subordinates in the areas of responsibility. It identifies the organization's goals and uses them to guide the managers and subordinates in setting individual objectives. When completed, MBO can be used to measure performance on how well the individual met responsibilities and furthered the organization in its mission. C. Jackson Grayson, Jr., in the May 1, 1978 issue of U.S. News and World Report discusses the merit in showing workers that they have a stake in the success of the enterprise, that their jobs and pay depend on improved efficiency.

Some gains in productivity may be attained by more management reinforcement to workers--such as feedback about results, and rewards for desired behavior. Feedback is the basis for setting new goals or revising existing goals before too much harm has been done. "The

process of building behavioral reinforcement into human resource management should attempt to structure the reward system in such a way that it represents a win/win situation."<sup>25</sup> This means that the returns of the program must not be one-sided, either toward the organization or the employee. Everyone must gain to bring about increased productivity. Management can give workers a share of the gains in productivity in the form of higher pay and increased job responsibilities and workers can devote themselves to a more sustained work effort while on the job.

One final comment on poor productivity hits upon the sociological aspects of the issue. Amitai Etzioni, professor of sociology at Columbia University suggests that the changing work ethic is a major factor. "If its true that more and more workers are stoned on the job, would rather collect welfare than work ... and if large numbers of people have begun to believe that hard work is unnecessary ... that may be causing the productivity slowdown."<sup>26</sup>

But this dim view of American workers is not held by everyone. Author Abram Bergson says, "The Americans are the best workingmen in the world. They possess the best traditions. After all, it was the energetic, able, skilled people who emigrated to America. They took with them the desire and ability to work hard and well."<sup>27</sup>

"The organization of the future is learning that

productivity can be improved by managing the most important resource, and that is the human resource,"<sup>28</sup> says Roger Howe, director of personnel and organizational development at B.F. Goodrich. The productivity return from the proper selection and placement of employees from ensuring the right use of skills, and from training and developing their skills so that they are more effective on the job should not be overlooked.

In conclusion, I would like to reemphasize the tremendous importance of increasing our productivity, not only to remain competitive with other nations, but for our own well-being right here in the United States. Because Americans want quality in their work lives and are constantly demanding more from the economy, they must join with management to attain these goals. American workers want a higher standard of living, more leisure time and better working conditions. Merely raising wages and prices won't get these, it will only produce inflation. We need to distribute the responsibility to all parts of our work society. Everyone must be concerned with increasing our productivity and do his share towards this end.

NOTES

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- 2 "Vanishing Vigor," Time, June 26, 1978.
- 3 "Stunted Growth in Productivity," Business Week, June 30, 1980.
- 4 "Why U.S. Workers are Producing Less," (interview with C. J. Grayson, Jr., U.S. News and World Report, May 1, 1978, p. 95.
- 5 Work and Your Future--Living Poorer Working Harder, by W. T. Morris, (copyright 1975, Reston Publishing Co., Inc.)
- 6 Basic Marketing, E. Jerome McCarthy (copyright 1978, Richard D. Irwin, Inc.)
- 7 "Let's Take Risks Again," by David T. Kearns (Management 383 handout)
- 8 "Risk-Taking Vital to Industry, Speakers Urge," Iron Age, September 15, 1980, p. 48.
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- 12 "Japanese Rap U.S. Managements," The Los Angeles Times, Sam Jameson and John R. Lawrence (Management 383 handout)
- 13 "Purdue's T3 'Man' of the Future," The Indianapolis News, Norm Bess, October 8, 1980.

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- 16 "Risk-Taking Vital to Industry, Speakers Urge," Iron Age, September 15, 1980, p. 50.
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- 21 "Productivity's Price," Forbes, February 19, 1979, p. 123.
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