STUDENT ESSAY

PRODUCTIVITY AND THE DEFENSE INDUSTRIES

BY

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US ARMY WAR COLLEGE, CARLISLE BARRACKS, PENNSYLVANIA

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Detailed analysis of economic productivity, to include its definition, components, measurement criteria, and causative factors for productivity decline in the United States. Excellent awareness of the economic conditions of the US during the 1970s and the effect of productivity on the US economy as well as the effect of other economic factors on productivity. Final portion of essay focuses on the impact of productivity decline in the defense industry, why it has occurred, and portrays a rather dismal future for the US defense industry through the 1980s. Conclusions and recommendations are

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based on well-documented research and persuasive rationale.

US ARMY WAR COLLEGE

INDIVIDUAL RESEARCH BASED ESSAY

PRODUCTIVITY AND THE DEFENSE INDUSTRIES

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The condition of the US economy has been an issue of concern to all Americans for several years. In large measure, economic problems of the late 1970s brought about the political demise of President Carter and caused the Republicans to gain control of the Senate for the first time in many years. There are many aspects to our economic problems. I propose to discuss only one — productivity. It is an issue about which we have heard much from both expert and novice. It is also an issue about which there appears to be a great deal of confusion. In this paper I don't propose to clear away all of the fog of confusion, but only to try to shed some light on a difficult issue. As a novice, I will try to put productivity and its importance in perspective for other novices, try to explain what has happened to US productivity and why, and also try to explain its impact and meaning to those of us charged with the nation's defense. I do not propose to make projections or offer solutions. I will leave that to the experts. In looking at the issue I have tried to consider it from the view of the administration, Congress, labor, manufacturers, the Defense Department and of course, economists. My approach will be to first define the problem, and then explain why productivity decline is important. Next I will provide a definition and explanation of productivity. I will then address the factors which have impacted productivity. Of necessity the background and discussion will be the major portion of the paper. It will then be possible to focus on some of the issues which impact on defense.

The first question one asks is — What is the problem? Simply stated the problem is that there has been no real growth in productivity in the US since 1973.[1] Data assembled by the US Department of Commerce shows that from 1968 to 1978, growth was 1.4%.[2] On the other hand, when we look at our major western international competitors in the market place, we see Japan, West Germany, France, and Italy with much higher growth rates. Similarly, when we look at US growth rates in the 1960s, we see it at 2.8%.[3] From the early 1960s to 1978 our productivity growth rate has been cut about in half. Taking the issue a step further, there appears to be concensus that the slow or nonexistent growth in productivity is not a temporary phenomena but one that will be with us for a while. This is in spite of the fact that evidence provided by former President Carter in his 1981 economic message shows that during the period 1977 to 1980, the volume of US non-farm exports rose by 35%, the share of US exports among total exports rose by 1 1/4% and the growth of industrial production in the US exceeded that in Germany, France or the United Kingdom.[4] Although we still have the largest economic machine in the world something is happening which is causing us to slow down while our competitors are booming.

The next question one asks is — Now that we know that productivity is going down, why is it important? It is important because it is related to our standard of living. If we don't produce it, we can't consume it. There will be fewer goods and services available which we all must share.[5] Productivity growth provides funds for other advances as explained by President Carter.

> Advances in Productivity are the foundation of advances in our standard of living. Increases in output per worker lead to increases in real income. Healthy increases in productivity

> can free the funds needed to improve the conditions of disadvantaged groups while lessening the need for sacrifice elsewhere.[6]

He goes on to say that when growth declines advances in living conditions are delayed but the expectations of an improved standard of living still exist. These demands can't be met without increases in wages and government spending that are unsupported by GNP growth. The result is inflation, a situation we now find ourselves in as a nation.[7] Productivity growth is related to GNP growth. At a 2% growth rate, productivity doubles every 35 years; at 3%, it doubles every 23 1/2 years. The difference between 2% and 3% means $600 billion dollars in GNP in the next decade.[8] That translates to the funds the President talked about to improve our standard of living and though not mentioned to provide for our National Defense. Further, historically, as productivity goes up, wages go up as does the amount of leisure time.[9] There is thus motivation to us as a nation in the form of dollars in our pocket and a better way of life to have a country which is growing economically.

It's time now for another question. What is productivity? Part of the answer to the question emerges when you discuss why it's important. Productivity is a measure expressed in terms of a ratio and is expressed as a percent of improvement. It is a measure of the use of resources as inputs to produce some output. The output varies as does the work performed. We can measure the productivity of one worker, of one section in a factory, of a factory, of an industry, and of a national economy. We can also measure the productivity of non goods producing operations such as banks and real estate offices, but as I will discuss later, it is a little harder to be specific about how you measure their output. Just as the output varies, so does the input. Inputs can be

labor of people, money, management ability, natural resources or tools and equipment. There can thus be many kinds of productivity and therein lies part of the problem and where much confusion originates. The two types of productivity most frequently used are labor productivity and total factor productivity. Labor productivity is the most common of the two and measures output per man-hours of labor.[10] Total factor productivity includes labor, capital and material. In other words, it includes all the inputs.[11] As you might imagine, it is more difficult to measure than labor productivity. Productivity is not a measure of the efficiency of production nor is it a measure of how hard the work force works. It is a measure of how effectively you use the resources available and is impacted by many things which are not specifically inputs or resources. Productivity is impacted by production techniques, the tools and equipment available, the skill of the work force, managerial ability, the scale of operations of an activity, materials, product mix, management-labor relations and the quality of the work environment.[12] It is also impacted by the cost of energy, government regulations, technology, capital investment, and the number of employees available relative to the equipment available.[13] Although one might logically assume that productivity should include characteristics of the output such as cost, timeliness, responsiveness and quality, it does not. The measure is concerned only with the fact that goods or services are produced.[14]

Hopefully I've now established some basis of understanding which will allow us to discuss the productivity problem in more detail and look at factors which seem to be commonly accepted as having impacted productivity negatively during the last decade. A caution is first

required. Though the factors I will discuss seem to be commonly accepted, the extent of their impact is not, nor can anyone come up with accepted approaches to solve the problem.[15] I will return to this subject later, now let's look at some of the particular issues. I will discuss the national industrial mix, inflation, governmental regulations, investment, energy, makeup of the work force, research and development expenditures, measurement problems and problems in coming up with solutions. The order of discussion is not necessarily in order of priority or significance. It is more a personal choice of a sequence. As you will see the factors are extensively interrelated.

Productivity on a national basis, and that's what we generally read about in newspapers, is affected by the total national economy and by the mix of industries in the economy. There are some industries which are labor intensive, others which are not. Some industries are expanding, others declining. Productivity on a national basis is thus a function of shifts in the mix of industries and their growth patterns.[16] As was said by Mr. Trowbridge, President of the National Association of Manufacturers, "Our industrial sector has stopped growing up and started growing old."[17] That means several things. As an industry or an economy matures its growth rate naturally tends to slow down and it tends to pursue other objectives rather than growth. Ideas such as environmental concerns, health and welfare, and social issues become important. As we will see, funds devoted to those important areas do not improve productivity. Also, as industries age, facilities, tools and equipment grow old. Productivity will increase only as these items are replaced by equipment that represents advances in technology which make it easier to produce more. Lastly, as the standard of living rises, the public demands more services than goods and the economy begins a shift from

manufacturing to services. This sort of a shift is irreversible as it is a function of the stage of our industrial development.[18] A review of trends shows just such a shift in our economy. A growing portion of our GNP is generated by service, trade and financial industries.[19] The same can be said for employment. In 1950, the service, trade and financial industries employed 28% of the working population; in 1960, 32%; in 1970, 38%, and in 1980, 44%.[20] The significance of this shift is that these industries tend to be low in productivity because they are labor intensive (i.e., they employ a lot of people relative to the tools and equipment available to help them produce) and because their outputs are difficult to define and measure. It has been estimated that the growth of these industries has been causing about a 5% decline in productivity.[21]

Naturally, as an economic measure, productivity will be affected by the condition of the economy. The US economy over the last several years has been characterized by high rates of inflation. Inflation equates to uncertainty. Business managers and financial institutions must make both long and short term decisions affecting their organizations. Inability to see the future and determine what will happen to inflation makes the risk of long term projects unacceptable. A manager will tend to invest in short term projects to beat current inflation rather than making the innovative, high risk long term investment which will improve productivity.[22] This is especially true when he is evaluated on his ability to make a profit now not on some promise for the future. The problem, as articulated in the President's 1982 Economic Message is common to borrowers and lenders.

> Because inability to anticipate the rate of inflation correctly increases the uncertainty associated with economic

> decisions, especially those that involve fixed dollar commitments far into the future, it leads to a shortening of the time horizon over which such committments are made . . .[23]

At a time of economic change and uncertainty caused by inflation, industry is faced with uncertainty in government policy, changing consumer demand, increased worldwide competition for resources, increased international interdependence and a global transfer of technology all of which give a firm's policy maker a narrow margin of error in the 1980s.[24]

I mentioned earlier that one of the things which happens as an economy matures is a turn to interest in things other than growth. That happened in the 1970s, spurred by governmental regulations aimed at environmental concerns, health and welfare. The regulations required redirection of a company's funds from those activities which directly improve productivity to other areas which do not. The regulations also tended to slow innovation and diminish investment incentives by business for new projects, according to the Congressional Budget Office. It has been estimated that in 1977, the cost of pollution abatement regulations was $22 billion or 5% of the capital outlays.[25] The National Association of Manufacturers estimates that in 1979, federal regulations cost the American people $103 billion which equates to $450 for every man, woman and child.[26] I do not intend to suggest that regulations are not necessary and that the end product is not desirable, but only that there is a cost associated with them. Unfortunately, that cost not only decreases the resources available as inputs but also is not measurable in terms of the benefits of a healthy work place, a clean environment and a safe product as part of the output.[27] This is one of those controversial areas where we know there is an impact, but we can't determine how much and whether we want to do anything anyway. Nor can we judge ancillary

issues such as worker attitude in his better work place, public satisfaction with better products and a cleaner environment and the impact of these issues on productivity and demand.

Earlier in the paper I mentioned that one of the factors that affect productivity is the amount of tools and equipment available to each worker to do the job and the condition of the tooling. It is recognized that capital intensive industries (those that use more capital stock, such as tools and equipment, than labor) have a higher output per man-hour than do labor intensive industries.[28] Higher output per man-hour means higher productivity. In order to maintain high output, industry must invest in new technologies which results in updating their capital equipment to new items which allow labor to do the job better. If because of the domestic situation labor is cheaper than capital, then industry will invest in more workers rather than more equipment. The relationship of capital to labor is called the Capital Labor Ratio and works like a lever. The longer the lever arm (more capital equipment per worker) the more weight that a worker theoretically can lift (higher productivity). The capital-labor ratio has not been high because there has been less investment relative to the number of workers.[29] Both private and government studies have shown that every extra 1% of GNP devoted to capital investment raises the productivity ratio by .2[30] and that capital investment and new technology can result in lower unit cost and account for about 80% of productivity growth.[31] In spite of the indications, the required investment has not occurred and the 1981 President's Economic Message notes that in 1979 most of this country's capital stock was over seven years old and had been in place since before the dramatic increase in oil prices.[32] Why has the investment

not occurred? The President's report verifies what we discussed earlier concerning the impediments to investment caused by inflation and the diversion of funds to meet safety, environment and quality of life requirements.[33] There are also other impediments such as energy costs and an influx of labor which I will discuss later. I said that I wouldn't discuss solutions, however, since there seems to be significant agreement that low investment is a major problem and that encouraging investment is important I will diverge. This clearly is an area for government action as articles from the private sector, Congress and the administration indicate. There needs to be balance established between the requirements for improving the economy and for improving the political and social aspects of life as well as adequate economic motivation in the form of return an investment.[34] Further, policies must be adopted which encourage investment by liberalizing the tax write off for depreciation and providing tax credits for depreciation.[35] Congress also recognizes the need for encouraging private savings which will be available for capital formation.[36] The key is to encourage the right kind of savings — not that commonly associated with investment in real estate but rather long term investments which make money available to industry.

As one might imagine, energy has been a problem. Here, as in other areas, the extent of the impact seems to be a question. Suffice it to say that energy prices rose significantly in the 1970s, but relative to everything else, rose by only 9%.[37] Further, the bigger problem seems to be that uncertainty over future energy prices and energy policy could have retarded investment and innovation.[38] The age of our capital stock and the extent of investment is indicative of the problem. Further, the impact of energy on inflation and the national preoccupation with solv-

ing the energy shortage possibly magnified the problem.

The size, makeup, skill and attitude of the work force is another area of impact on productivity simply because labor is one of the major inputs. Again, as one might expect there is a difference of opinion concerning the extent of the impact though there is agreement that it did occur. First, during the 1970s, there was rapid growth in the labor supply due to the coming of age of the baby boom generation.[39] At the same time that investment funds dried up and motivation to invest declined due to inflation, the supply of labor went up making labor relatively cheap. Knowing what we do from earlier discussions about the productivity ratio, the limited amount of capital investment, and the leverage effect of capital stock, it is easy to see that with more labor producing the output the capital-labor ratio goes down and there is a depressing effect on productivity. Further, the mix in the labor force changed during the 1970s. A larger portion of the labor force was inexperienced because of the influx of young or previously unemployed workers. The ratio of employed adult males to total employment changed from 67% in 1950, to 58% in 1970, and 54% in 1980.[40] Youths age 16-24 (male and female) went from 21.5% in 1970, to 24.3% in 1977, and women from 38.1% in 1970, to 41% in 1977.[41] There is controversy over the effect. Unskilled and inexperienced workers tend to equate to lower productivity in the mind of at least one corporation, General Motors, who argues that they experienced this phenomena.[42] On the other hand, a counter argument goes that the impact was minimal because the inexperienced workers tended to be better educated, meaning that they learned their job quicker, and more mature (women), meaning that they were more reliable and dedicated.[43] Demographic changes in the 1980s will resolve

the controversy as the number of inexperienced workers (youths) will decline and the current working population, though younger, will gain experience. If projections hold true, then productivity should increase and unemployment decrease. This of course assumes that other aspects of the economy improve so that jobs are available. One last characteristic of the work force which could have an impact on productivity is worker attitude or the work ethic. The impact is difficult to measure. A Congressional study argues that there has been no deterioration in the last 30 years and further indicates that there has been little change in either the sick rate or the quit rate, both attitude indicators, in the period 1973-1978.[44] The study fails to show what those rates were during earlier time frames. Unions make the argument that the worker mix is the same in all industries regardless of whether they are high or low productivity so there is no reason to suppose that the work ethic has changed.[45] They fail to account for the fact that some industries such as electronics and optics employ more skilled and more educated employees who tend to be more highly motivated than unskilled, uneducated workers. Nor do they account for the adage, true or not, "Never buy a car built on Monday or Friday." I think the question is an open one.

The next factor to consider, Research and Development expenditures, relates back to inflation. Since R&D investments made today generally show results with new technology five to ten years in the future, such investments show faith in the future. As we have discussed, uncertainty in the economy developed in the 1970s, investment funds became scarce and expensive, industry turned to short term rather than long term interests, regulations and energy added to costs and the economy contributed to sluggish sales. Thus, the prospects for return on

investment deteriorated and R&D investments declined.[46] The trend in R&D spending as a percent of growth is shown below.[47]

TIME FRAME	TOTAL	FEDERAL
1953-1965	9.9	11.7
1965-1973	1.0	-1.5
1973-1978	1.8	0.4
1978-1979	3.4	2.3

With the lag that exists in the impact of R&D expenditures we can see that reduced investment was felt in the mid-1970s and will continue through the 1980s, but did not really contribute to the productivity decline which began in the early 1970s.[48] Not only has the amount of R&D changed, but the nature of R&D which is undertaken has changed because of the economy and industry's evaluation of risk. Whereas R&D efforts used to be free wheeling and general in nature leading to significant technological advances it is now controlled more, related more closely to a product, done increasingly overseas, and underinvested in the civilian sector.[49] The significance of the last characteristic can be judged by looking at R&D expenditures by our major international competitors. The below extract from a Congressional Budget Office report depicts R&D distributions in the late 1970s in percent of total.[50]

	US	FRANCE	GERMANY	JAPAN	UK
National Defense	51	30	12	2	46
Economic Development	9	23	13	23	20

The message underlying our current situation is clear. By reducing R&D expenditures in basic research we face the danger of losing our technological edge and thus losing our ability to compete effectively in the international market place. Not only will we fall behind in developing new products but also in developing new processes for making things better and cheaper. The relatively low levels of current R&D are further aggravated by the uneven split between defense and economic R&D. Though a bright spot for those of us in defense it can cause further deterioration in our competitive position.

I now turn to the problem of measuring both input and output in the productivity ratio. There appears to be considerable feeling that inaccurate measurement has understated actual productivity growth. There are several possible reasons for the understatement. Because of inflation, output figures are adjusted by price indexes. Such adjustment can build in some error and inconsistency. The areas most difficult to measure the output of are construction, finance, insurance, real estate and services so statistical techniques are used as substitutes. Again, the potential for error exists. Then, these same industries with the largest measurement problem account for about 23% of the total hours used to measure productivity.[51] Couple this information with what I wrote earlier about service industries becoming a larger part of the national economy and you can see why measurement is a problem. Consider also the biases in measurement when the cost of a cleaner environment is counted as an input, but we can't count the benefits as an output and when businesses do not reduce the work force in the same proportion as demand slackens or vice versa.[52] Further, consider the problem

of aggregating easy to measure data from manufacturing with hard to measure data from services. When an activity is evaluated there is the problem of measuring and aggregating data on inflation, quality changes, technical improvements, blue collar workers, white collar workers (overhead) and the work environment as well as deciding whether to evaluate cost centers, plants, companies or corporations.[53] There is definitely a measurement problem but the problem is like a "Catch 22." The more information available to us, the more sophisticated and smart we become, the more we want to know and the more rapidly the unknowns increase. In short, we may be comparing fruit salad today with apples of ten years ago. Both are good to eat, but they don't look or taste the same.

We have looked at the factors which affected productivity in the 1970s. In considering their nature and complexity it is no wonder that there is confusion among the experts. The dilemma is perhaps best expressed in the following extract from a Congressional Budget Office report.

> Government policies can affect productivity growth. But it is essential to recognize that the root causes of productivity growth are complex, interdependent, and ramify into almost every economic activity. The decisions of individuals and business enterprises concerning how much to save or invest, and in what form, affect productivity. So do decisions to acquire training or education, to have and rear children, to seek employment, to move from one area to another, to adopt a different production technique, or to use a particular form of transportation. The same holds for national decisions to change defense policies, to raise barriers against foreign goods, or to enforce antipollution standards. . . .
>
> Policies to encourage faster growth in productivity cannot be pursued in isolation from general macroeconomic policies. What happens in the economy as a whole will have an important effect on productivity growth. The major determinants of productivity — the quality of the labor force, the accumulation of capital, and the pace of technological change — are strongly affected by the economic environment.[54]

The dilemma was further articulated by economic advisors to two presidents. For instance, do you pick the winners and losers among industries and then back the winners and beef up the losers?[55] If you develop tax policies to encourage productivity, favorable rates can shift investment from one industry to another or from one input to another.[56] Either approach can cause major restructuring of the economy. Both the labor community and the economic community seem to agree with the types of things that need to be done, but don't address how. They feel that inflation must be lowered, worker skills must be upgraded, incentives for improving capital equipment through R&D and investment must be developed and better management must be employed.[57, 58] Congress also seems to agree and outlines required policy options to be:

1) Tax policies to encourage capital formation rather than consumption as at present.

2) Adjustment of government regulations to consider productivity while at the same time motivating social improvement.

3) Encouragement of new technologies by credits for R&D and liberalized depreciation.

4) Improving skills and adaptiveness of workers

5) Developing a national industrial policies approach as does Japan[59]

They then go on to outline limitations:

1) Can government really influence the action

2) The conflict between productivity and quality of life goals may not be resolvable

3) Are necessary policies politically feasible, considering antitrust laws and trade tariffs

4) Can policies be developed which are administratively simple.[60]

Congress in their analysis states that we can't expect rapid improvement and that before any real improvement is possible changes in national priorities are required.[61]

Now that we have covered the issue of productivity in general and looked at some of the factors which have had a negative effect on productivity growth, it is time to turn to the issue of concern to us and that is the significance of our decrease in productivity on national defense. First, I think one should understand that what impacts the national economy also impacts those industries involved in defense business. The same problems tend to beset all industries, though in varying degrees. However, the nature of doing business with the government is different than the relatively free market place so there are some different problems and some problems are magnified. I do not intend to look at either government productivity or at productivity in the Armed Forces. I will look at only selected industries in the manufacturing sector which produce items used by the military.

Since we are now looking at only the manufacturing sectors of the economy, it is important to note that manufacturing productivity tends to be higher as a whole than national productivity figures. Reasons for this fact go back to some of our earlier discussions. Manufacturing tends to be capital intensive rather than labor intensive, thus, it tends to have higher productivity. Also, measurement problems tend to be less in the manufacturing sector, though they do exist. It is easier to measure productivity when you have relatively defined outputs and inputs. Lastly, our figures do not include the productivity depressing industries such as services, trade, finance and insurance. For comparison purposes, where productivity nationally was 1.4 in 1978, in the

manufacturing industries it was 2.3. Taking a closer look at productivity in 1978 for industry groupings with specific importance for defense, we can see the picture more clearly. Consider the five groups below and their products of importance with productivity also shown in parenthesis.

1) Primary metals (-.64) provides steel, aluminum and other metals used among other things in combat vehicles, and the foundry industry which casts hulls.

2) Rubber (1.74) provides tires, track pads, and hoses

3) Machinery (1.41) includes the tool and die industry which is responsible for retooling and the ball and roller bearing industry

4) Electronics (3.44) provides all electronic equipment

5) Instruments (1.35) provides optics and sighting devices used in combat vehicles and instruments.[62]

In all cases productivity in those industries is lower than in previous years and with the exception of electronics is lower than the manufacturing sector as a whole. The Defense Science Board (DSB) conducted a study in 1980 which looked deeply into the problems of defense industries. Their study found that in the primary metals industries, the aluminum industry was moving to offshore production rather than new investment in the US, and the steel industry has aging plants with little motivation for updating due to heavy foreign competition and environmental restrictions. Further, the forgings and castings industry was commercially oriented with increasingly long lead times as a result of the fact that over 400 foundries have gone out of business in the past decade due to an inability to meet EPA and OSHA requirements. In the machine tools industry (tool and die) there are a large number of small companies (of 1300 firms only ten employ more than 1000 people and

only two more the 2500) with a severe shortage of skilled craftsman, increased foreign competition, and because of their size, difficulty in getting investment capital. Also, because of their size, they have difficulty in coping with the red tape of defense business and as a result are not interested. The electronics industry is also moving to offshore production with 80-90% of military semiconductors tested and assembled outside of the US while the military accounts for only 7-10% of their business. The munitions industry is dependent on government furnished machine tools which are 20 years old due to no government money to upgrade them and no incentives to industry to invest in tooling with limited usefulness.[63]

In their detailed analysis the DSB concluded what we already guessed, that firms engaged in defense business suffered from the same productivity problems as everyone else. They went on to conclude as we already have that productivity in the defense sector was actually lagging the rest of the manufacturing sector. The lag was caused in part by lower levels of capital investment due to corporate business decisions. Most defense firms are part of corporations which are involved in many diverse activities and markets. When they make financial decisions in hard times, they evaluated defense programs and concluded that return on investment was lower, defense programs were not stable, the government owned machine tool base was inadequate, and most defense programs did not operate at or near the most efficient production rate.[64] Incentives were not there so when limited funds were available investments were made in the commercial sector.

Market factors do not stand alone in causing business leaders to either shy away from defense business or not upgrade facilities.

Defense policies themselves are not motivators. For instance, competition is considered to be an effective motivator for productivity improvement, however, in 1979 over 63% of the dollars spent in contracting were on non-competitive buys. Of course there could be many reasons for that. Further, policies in contracts seemed to be disincentives to productivity improvement as they reduced the cost base on which profits were figured, did not provide sufficient rewards for capital investment to justify the investment and did not provide a clear system for tracking and measurement.[65] There in fact appeared to be no single coordinated defense policy to address the issues of motivation, capital investment, value engineering and technology updating so that all were working toward one end. Instead the often conflicting and divergent policies pull a manager in different directions and can cause him to take no action or take a course of action inimicable to our best interests. In short, defense policies make a manager's already tough decisions tougher.

There are some motivations to industry to get involved in the defense sector. Some of these are the development of high technology which may have commercial applications, the fact that successful producers can often count on long production runs to amortize overhead and facilities costs and in a period of slow business activity the business provided by defense is better than no business.[66] It is easy to see, however, that the impediments loom large. Most specifically, any prudent manager when faced with a decision in tough times, will go with a winner rather than a loser. Patriotism can't be banked nor can it be shown on a ledger when a manager's job performance is being evaluated.

The national productivity problem hits us doubly hard. Not only do we see a relative decrease in our standard of living and our ability to

provide essential services, but we also find that because business in defense is less desireable than with the commercial sector, industry is devoting less of their total resources to defense related productivity improvements. Given that the defense sector receives less attention than the commercial sector by industry the national productivity decline is magnified. The only bright spot for defense is R&D and that is directed by the government. All of the factors discussed earlier which have brought about a decrease in the size and capability of the U.S. industrial base in terms of technology, age and number of facilities point towards higher weapons systems acquisition and operations costs. Further, as more industries move work offshore because of a more favorable foreign economic climate we become more dependent on foreign sources because our national base is allowed to deteriorate. Not only will we lose our economic competitiveness, but we will lose our military competitiveness and national independence as well.

ENDNOTES

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