Factors of production

by Congressman Norman Mineta

Government can provide an environment that is conducive to the success of business, and government can also erect obstacles which make success impossible. For example, the operations of business require public utilities, public educational systems, publicly funded research, and publicly regulated channels of transportation and communication. But skewed governmental tax policies, misguided laws, and barriers to free competition can doom productive business. Willy nilly, high-technology business enterprises are inextricably linked to the policies of their government.

As a member of Congress who represents part of California's Silicon Valley, I have seen that the semiconductor and electronics industries touch upon many of the most intriguing and contentious political questions of our day: military spending, social spending, monetary policy, trade policy, industrial policy, educational policy.

Consider some of the most basic public policy questions now pending both here in the United States and in Europe and Japan. Should your government spend large portions of public revenues on military projects? Some may gain business from defense contracts, but others may suffer because America has a shortage of engineers for nonmilitary projects. Moreover, others are hurt by the higher interest rates and inflated prices which result from high levels of military spending and bloated deficits.

Should the government maintain, raise, or lower taxes? None of us likes giving up money. But business depends upon the goods and infrastructure provided with public funds. It depends upon roads and airports built with tax revenues. It depends upon technological advances provided by tax-subsidized research. It depends upon people whose training has been assisted by tax revenues.

And, of course, we must ask ourselves questions about trade policies. The problem is to protect ourselves against unfair trade practices without depriving ourselves of the benefits of free trade. Many employees are unable to move to another field or another section of the country; how should we deal with the fact that this week's laid-off employees may not be the same person as next week's new-hire? The fact is that people are not infinitely flexible and redeployable factors of production. Perhaps there are cases when our government should protect a declining firm or industry to lessen human dislocation.

Some people prefer to avoid the arguments which these questions provoke. But the issues will not fade away. So there is plenty of controversy. But I believe that useful public policy depends upon the successful discovery of consensus. Despite the questions I have raised, I believe that there is a great deal of room for agreement in the policy issues affecting high-tech industries and in particular the electronics industry. Moreover, these realms of agreement have led to several current useful legislative proposals in the United States Congress.

Research and development: antitrust. First and foremost we can agree that research and development provide the lifeblood on innovative, growing industries. Firms in the electronics industry are buffeted in the tides of rapid technological change, and their survival often depends upon their ability to rise with those tides. Here in the United States, our government has sometimes proven insensitive to their situation. As a result, entrepreneurs may face some senseless prohibitions of antitrust law, some unreasonable taxes, and burdens because of insufficient funding for education and research.

Efforts to adjust U.S. antitrust laws, in order to permit joint R&D ventures, offer us further room for agreement and productive action. Many U.S. companies have already joined together in R&D ventures, but the antitrust laws have not yet been changed to ensure that these companies will be free from burdensome and unnecessary antitrust challenges from other private parties or from the government. We Americans have witnessed the successes of foreign competitors who have been able to cooperate in basic R&D ventures, and these successes provide further strong arguments for promoting such associations in the U.S. By allowing our domestic companies to work together on R&D projects, our companies will be able to avoid unnecessary duplication of effort and inefficient use of resources.

Just how the antitrust laws should be changed is still being debated. Some of the proposals currently being considered include measures which would provide full or limited immunity from antitrust prosecutions or a safety-net provision limiting antitrust penalties to actual damages or single-damages instead of the present triple-damage awards. Some proposals call for "safe harbors" if the venture can satisfy standards assuring probable lack of significant anticompetitive effects. The idea of the "safe harbor" is to permit businesses to undertake certain joint R&D projects with the knowledge that because the projects meet predetermined minimum standards assuring that anticompetitive results are unlikely, investments can safely be made in the projects without concern that antitrust problems will subsequently undermine the project. I think all of the current proposals deserve study, and in principle they warrant support. Again, I believe that after hearing and considering the views of those concerned we can coalesce in agreement about the need for some reforms of U.S. antitrust laws.

R&D: tax. These are fields calling for new congressional initiatives. For example, to spur investment in R&D, many of us in Congress supported legislation providing tax credits for investment in research and development. In 1981, such legislation was enacted. Fortunately, the credits provided by that legislation have been highly successful in promoting new product development. But the credits
were provided only on a temporary basis, so it is important that support be displayed for proposed legislation for the development of new products which is now before Congress—legislation to extend the R&D tax credit and make it a permanent part of our tax code. I support that legislation. Moreover, it is important that the legislation that emerges gives fair treatment to all important forms of R&D, such as computer software as well as hardware.

Even the sticky issue of taxes can, I believe, invite productive agreement. Policy makers in Washington have begun to appreciate the fact that while President Reagan's Economic Recovery Act of 1981 provided a windfall for traditional and "smokestack" industries, it did little for high-technology industries. In 1981, too few understood that high-technology companies depend upon relatively short-lived equipment to survive in a constantly changing industry. As a result of that oversight, the 1981 Recovery Act provided tax breaks for traditional, capital-intensive, "smokestack" industries—tax breaks which were nearly irrelevant for the high-technology electronics industries. It is now time to cooperate in an effort to get such industries some reasonable depreciation provisions in the U.S. tax code—provisions which will benefit high-growth electronics companies.

**Chip protection.** Representing Silicon Valley, I have also become acutely conscious of the fact that the special nature of R&D for silicon chips requires further legislative reforms. Representative Don Edwards and I have introduced the Semiconductor Computer Chip Protection Act (H.R. 1028) in the U.S. House of Representatives to address this fact. Our bill provides much needed copyright protection for the layouts and mask patterns of computer chips. Legal acknowledgement of the property rights of the owner of a chip layout embodied in mask designs will ensure that the time and money spent by a company to develop a new chip will be a worthwhile investment. Innovating firms often spend years, thousands of engineering manhours, and millions of dollars in order to develop a new large-scale integrated semiconductor circuit design. Yet a competing firm can photograph a chip and thus duplicate the masks used to make it, in only a few months and for a cost as low as $50,000. Once again, I believe that we can agree—we can agree on the basic principle that reasonable copyright protection is both fair and productive. And that principle can help move us toward the legislative reform embodied in the Semiconductor Chip Protection Act.

**Education.** Of course, neither incentives for R&D nor tax credits for rapidly changing industry.As

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depreciating capital can take full, beneficial effect if our electronics companies do not have the trained personnel necessary to utilize opportunities in high-tech industries. There can be no doubt that the international technological revolution has caught the United States understaffed and surprisingly undereducated. You may have heard about the American Electronic Association report which concluded that America’s educational system needs to triple its output of electrical and computer science engineers in the next five years if it is going to meet the needs of the electronics industry alone. Indeed, it is staggering to consider the small number of people on whom the United States depends for its technological expertise. For example, out of 200 million Americans, only 1000 are trained to design large-scale integrated circuits.

In recognition of such deficiencies, the United States House of Representatives has passed the Math and Science Education Act of 1983. This bill authorizes funds to improve and increase math and science education at all levels in America, to update facilities in our university laboratories, and to promote stronger ties between research in our universities and innovations in our private industries. That bill is currently being considered in the Senate, and I hope that we can also cooperate in an effort to get the Math and Science Education Act passed in Congress and signed into law.

Yet we must do more than offer seed money to improve our academic environment. The U.S. government will have to offer more than that to help update our educational systems and provide the crucial braintrust necessary for the success of your industries. I am now supporting measures in the House of Representatives to provide tax credits to companies donating computers and other scientific equipment to our nation’s schools. That is probably only one of many bills which could get private companies to help improve the technological education provided by our schools. For example, I feel that the federal government could and should cooperate in some way with private firms in the effort to provide a sufficient supply of high-calibre educators. Concerned citizens in Silicon Valley have begun to worry about the “Brain Drain” developing as firms hire away vitally needed professors. I think we can all agree that Congress, private industry, and the educational community should work together to help preserve our nation’s precious supply of teachers, so that we will have people who will train the next generation of scientists and technologists—and not, in effect, eat our own seed corn.

Trade. There is another point on which we can all agree—that is that without international trade, the electronics industries would suffer immensely. And if all the measures I have discussed are to bear their full and fair dividends, we must also address the state of world trade itself. The current administration has imposed severe and unnecessary restrictions on the export of many technological products, thousands of products which our military adversaries neither want nor need and which are readily available from other sources. As a result, business people have to waste through a sea of bureaucratic red tape. Again, I think we can agree on appropriate legislative redress. We should adjust the legislation which allows all of these unnecessary and detrimental restrictions, the Export Administration Act. In Congress, we have been working to amend that legislation so that only the trade restrictions which truly promote our national security will remain in place. Here again, we should remind those who hesitate that our national security depends upon vigorous trade as well as military might.

Involve. All of these initiatives address specific concerns of the electronics industries. But I think it is important also to try to grapple with a wider array of public policy issues. As the high-technology lobby matures, there may be a great temptation to think only about devising a menu of tax credits or public incentives which affect your balance sheets. But it must be recognized that all decisions about high-technology issues in the public sector will have to be made within the context of larger decisions about our future. Therefore, just as government provides essential factors of production for industry, concerned citizens must provide the essential factors of production for government. We must all involve ourselves in the broadest issues of our day, such as foreign affairs, the provision of health care, and the maintenance of our environment. All of these deserve your attention. Government needs your energy and your expertise.

Norman Y. Mineta (D) represents California’s 13th Congressional District, located at the southern tip of San Francisco Bay. The district includes portions of San Jose and the Cities of Campbell, Los Gatos, and Santa Clara, as well as unincorporated parts of the County of Santa Clara.

Born in 1931, Mineta was one of 110,000 Americans of Japanese ancestry who were evacuated from the West Coast and placed in relocation camps during WWII. Attending schools in San Jose, he later graduated from UC Berkeley in 1953 with a BS in business, then served on active duty in the Army as an intelligence officer in Japan and Korea.

Commencing his political career in 1962, Mineta served in a variety of local offices including membership on the San Jose City Council and mayor of San Jose. He has held a seat in Congress since 1974, serving on several major committees ranging from the Public Works and Transportation Committee to the Select Committee on Intelligence—posts he continues to hold today. Currently he is also a member of the House Committee on Science and Technology, where he serves on the Subcommittee on Science and Applications and the Subcommittee on Science, Research, and Technology.

Letters

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It is difficult to describe a microprocessor with only a few symbols. To integrate more parameters, one should also indicate the size of the on-chip memory and the clock speed—one should call the Z80000 a “32/32 C256 K5” processor, for instance, since it has a multiplexed 32-bit address and data path, a 256-byte cache, and a 5-MHz bus clock (which is more meaningful than the CPU clock). The 8051 would be a “17/8 R4K + M128 K12,” since it has two address spaces, 4K of ROM plus 128 bytes of RAM, and a 12-MHz bus clock. Such a method of description would be rather cumbersome, of course.

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