

ANTONELLO? WHY DID THE US LOSE THE INDUSTRIAL COMPETITION WITH JAPAN AND OTHER COUNTRIES?

Well we had a setback in productivity growth. I think undoubtedly we started, in comparison with other countries, with a big advantage. So we weren't careful enough to retain our advantage. In addition we had a very bad decade, the decade of the 1970's. Where our technological gains went in reverse. That is we had declining productivity. I believe that a great deal of that decade was spent in becoming energy efficient. Or more energy efficient than we were. We were very wasteful in the use of oil and gas and other energy resources and suddenly when the world was hit with the higher price of oil after the oil embargo of 1973 then we had to scramble to become more efficient. We were successful but we spent almost 10 years in achieving that success.

ANTONELLO? ARE THERE OTHER REASONS??

Well there are other ..the other reasons are much more complex. Our educational system was not kept up to the higher standards that we had traditionally maintained, especially at the younger ages elementary and high school education. We had a very bad decade in the 60's in connection with the Vietnam war and a counter culture and attitudes of young people and those fed back on us in the sense that there was less of an interest in achieving high educational performance by young people and a kind of an aimless lack of meaning of life for many of the young people. And then in industry we started in a period of advantage and we felt so comfortable with that advantage that we didn't maintain it.

ANTONELLO? CAN YOU DISCUSS THE CONSEQUENCES OF MILITARY SPENDING?

In most economics classes in the elementary book we begin with the concept of tradeoffs in life and the most important tradeoff guns and butter. And of course that is symbolic but I think that is a very good example. Symbolism is right. Country that goes very heavily into military spending takes away the possibilities of providing civilian goods. And I would say the countries that spent high percentage of their GNP or total production on military or defense goods had a poorer overall economic performance and certainly a poorer technological performance. The American figure was on the whole was about 5 or 6% and then when we had the Korean war and the Vietnam war went to even higher periods during the intense fighting. Countries that had low military budgets, in particular Japan and Germany, as was forced on them after the 2nd WW, did very well in terms of civilian technology and standards of living. Now we're learning a lot about Soviet Union and China the socialist countries now that there's restructuring and more openness. We used to think that the Soviet Union was devoting about 18% of its GNP to military. And now we think on the basis of new information it was probably as high as 25%. Now the Soviets didn't know that is the people who were spending knew what they were getting while they were spending, but they didn't know what that was taking from the total economy. And the very poor performance, especially in recent years of the Soviet economy associated with its very high military spending seems to point to some of the issues and in particular the Soviet output for civilian use was very low quality. They knew that all along, but now they have a very good explanation for it. And the same thing happened in China. And once these countries have tried to expand and join the rest of the world in

terms of a better economic life or seeking a better economic life they are cutting back on their military.

ANTONELLO: ONE OF THE REASONS THE SOVIET ECONOMY IS SUCH A DISASTER IS BECAUSE OF THIS HUGE MILITARY SPENDING?

That's right. The military industries in the Soviet Union that produced consumer goods, clothing, food other goods for the military, they were the better quality. And even then they weren't top quality. And the goods the companies that produced purely civilian output were producing a very low quality output and not very much of it.

ANTONELLO: CAN YOU EXPLAIN THIS TYPE OF MIXED ECONOMY? SOME MONEY GOING TO PUBLIC SOME TO PRIVATE..

Well the distinction between military spending and civilian spending and its effect on the economy is similar to the distinction between public and private in general. And since the world is going now in such a strong direction toward private spending, the public sector is getting neglected to some extent. And we see some problems. Now in this case we're talking about public/civilian spending. And my point of view at the present time in thinking aloud about america's current problems is we need a certain amount of public spending for certain kinds of resources such as education, communication, transportation, sanitation systems. And they in turn improve the productivity of the private sector. In making the distinction between military and civilian spending, I've always noted that military spending does not create capital that can be used for useful production in the future. And civilian spending on the other hand can be channeled, in a capital sense, toward goods that are going to produce useful output for twenty years. And that will make the economy function better. Not only because it will help the private sector but also because it will produce goods that are useful in their own right.

ANTONELLO: WHAT ARE THE ECONOMIC CONSEQUENCES OF HUGE PUBLIC SPENDING ON APOLLO AND SDI??

Well I think both had enormous investments and

I think both the Apollo Project and the SDI project had enormous expenditures. In some sense they both produced something that is useful in its own right. That is a country will always want to be inquisitive. And so we want to know what space is like and a great country, like the US, ought to be able to achieve a moon landing. Whether its a useful thing in terms of production or not. We should try that. And we should satisfy our inquisitiveness. We did that. The Apollo program had many new technologies, very much associated with laser technology and communications and air transportation. So they had some spinoff but probably not at all in very big proportion to the total cost of the project. The case of the SDI project, the expenditures are large the output is very sophisticated but it's very difficult yet to see where the civilian spinoff is going to come.

ANTONELL: IS IT DIFFICULT TO TRANSFER TECHNOLOGY FROM ONE COUNTRY TO ANOTHER?

Well, its an interesting question to ask whether the poorer countries, especially developing world, third world, will achieve the technological fruits of the advanced world, technological countries. In one respect we could say that meeting tech, or low tech is relatively easy to transfer. An

example of that has been the course of economic events in the far east. Japan first mastered, let's say optics, electronics, small devices in the early period of their post-war recovery, say around the 1960's. Then Japan moved on to motorcars. The Japanese motorcars of the early 60's weren't very good on a world scale. They were very primitive and lacked most of the things we like most in Japanese cars now. Japan decided to concentrate on this higher line of output and did very well at it. And gradually they moved out of electronics and optics. They do it but Korea can do it just as well. Taiwan can do it just as well. Singapore can do it just as well. So the things that Japan used to do to get their start were then transferred to other Asian countries. And now Japan is pushing for the super computer for the best in bio-technology, for the top of the line in all kinds of technological activities. And the countries that took the first line of goods from Japan, Korea and Taiwan, are now just beginning to get their start from Science Parks and other technological activities in a higher range of goods. But not at the super computer range. They would be at the range of making clones for modern micro computers. And the easier things will go to the next line of countries. They will go to Thailand, to Malasia or even in some cases to India, Pakistan, Sri Lanka. I know myself that I started a scientific journal with some Japanese colleagues in the 1960's. And it became too difficult too expensive in terms of Japanese labor. A to continue the handcasting of scientific type. And that is now done more cheaply in america with automatic devices. But if you wanted the handtype, then you would go to the poorer countries of asia to get handsetting of unusual characters or tabulations. And the whole transfer of technology has been too shift the lower level to a country where there's a lower degree of skill, technique, education. And then for the primary country to go on to the highest level. There has been a very good transfer of technology. But it has always been transferred with some degree of downgrading.

ANTONELLO: HOW EASY IS IT TO CLOSE THE TECHNOLOGY GAP BETWEEN THE WESTERN COUNTRIES AND THE DEVELOPING COUNTRIES?

Well, the developing countries all aspire to have higher standard of living and to be the next Korea. But that's not easy because they will have to adapt the same working standards, the same individual efforts, intensive efforts that Korea made. And they will have to have the same kind of strong educational program. And probably endure relatively low wages for awhile. But there will be a break-out period and we're seeing that break-out period now in Korea. People who made possible the technological advancement in Korea now want a greater share of the goods and they're asking for much higher wages. That makes it more difficult for Korea to maintain the same pace of advance but they will find some way of overcoming that but the wages will be much higher.

ANTONELLO: TODAY SCIENCE AND TECHNOLOGY REVEAL LARGE CONTRADICTIONS. ON THE ONE SIDE THEY CONTRIBUTE TO SOCIETY AND AT THE SAME TIME THEY DESTROY SOCIETY AND THE ENVIROMENT WITH THEIR WASTE AND BYPRODUCTS.

Well, I think probably in the next decade or two, there will be more and more attention paid to side effects, particularly enviromental issues. There are many organizations now in the world and many governments that are getting much more concerned about enviromental matters. That will seemingly slow the pace of output but we have a way of justifying that economically say we get a higher quality output. Or we get a clean output instead of a dirty ouptput. You can have cars but you can have dirty cars or clean cars. And we're getting clean cars and in a social sense that's better for everybody. So there will be more attention paid to that. There are still some very serious debates about how fast this

is taking place. For example global warming, depletion of the ozone, scientists and technologists are divided as to whether that is happening at an alarming rate or not. But once we see a problem and once we see that its well defined then we will deal with it but as in any kind of economic problem, there's no free lunch, so there will be a cost to deal with it. And we will have to put up with that cost.

ANTONELLO: HOW DOES THE END OF THE COLD WAR EFFECT THE TWO SUPERPOWERS??

Well probably the most important event of recent years has ben the ending of the cold war. Some people put it in terms of "freeing up" the populations in Eastern Europe or changing the economies of EAStern Europe. Or some people might even say the Gulf conflict was the important issue but I think the most important thing was the ending of the cold war. And that tied up enormous resources in North america, the soviet Union, and in Europe being prepared for something that could have been a calamity for people but fortunately it didn't happen. But it was an enormous waste to have this degree of preparedness.. Now if the soviet Union cuts back its military spending in order to enjoy a better life, say from 25% or 20% of its GNP to as little as 10 or 15, that would be a step forward for them. And they are doing that, I would say, out of necessity. Now in addition, if we reach accomodation, and the Soviet Union joins the world organizations and we cooperate with them and if we invest capitol in them then there will probably be further reductions. We are already scaling back conventional forces in Europe. We are about ready to have a Strategic Arms Limitations agreement. And the calculations that have been made at the UN suggest that all countries in NATO or what was the Warsaw Treaty Organization could cut back military by about 3 - 5% and do it over a long period of time. And I think there estimate is that if the industrial countries alone do this we could save about one thousand billion dollars over ten years. Which would be an enormous sum that could be devoted to technological and economic improvement throughout the world. Much of it could be used in restructuring and reforming Eastern Europe.

Second line is that the developing countries who are engaged in the world arms trade to a high degree. Both as a supplier in the case of Brazil, and China, and North Korea. Or as a user in the case of Iraq and Iran and other countries in the Middle East. We could see another one thousand billion. So there would be a possibility of devoting many more resources to peacetime civilian production. In Iraq alone people have remarked, that if the country had used what it spent on military in the last 10 years, for civilian life that people would have been much better off. Iraq could have enjoyed a much better economic existence.

ANTONELLO: THAT COULD BE SAID ABOUT A LOT OF COUNTRIES, ALSO ABOUT THIS COUNTRY.

Yes and as I said earlier these goods can produce a useful output for the next 10 or 20 years whereas a scud missile on explosion doesn't produce anything.

ANTONELLO: WHAT IS YOUR IDEA OF PROGRESS

Well the idea of progress is to have a more peaceful world. It's somewhat Ivory tower and idealic to say a completely peaceful world. But we could say a more peaceful world. A better distribution of income. Better distribution among countries and better distribution in countries. And more attention paid to producing goods that people can use and

producing clean goods that people can use. These are the conditions and objectives of social progress.