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Discussion

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## Discussion After the Speeches of Deborah L. Wince-Smith and Dr. Stuart L. Smith

QUESTION, *Professor King*: I have a question for Deborah Wince-Smith. We heard about where we stand. Is there, in fact, an awful lot of water over the dam or is our situation retrievable in terms of what can be done? Is it too late? Also, you mentioned the Japanese situation. Do we have the same problems dealing with the Germans?

ANSWER, *Ms. Wince-Smith*: I did not want to leave the impression that everything is black and problem laden. I think we have tremendous opportunities. We do need to link these small entrepreneurial companies across the United States with some bigger players that have the manufacturing and marketing capabilities for market success. Again, so many of these barriers are cultural.

We learned last year that there are really only three sources of capital for small, high-tech entrepreneurial firms in the U.S. where significant innovation is occurring: 1) Private family money, mortgaging your home, etc., 2) What are referred to as angels, i.e. wealthy private individuals who serve as secret, silent investors and allow the firm much independence, and 3) Phases 1 and 2 of our Small Business Innovation Research Programs ("SBIR"). Now, the sad thing is that the taxpayer often invests in these dynamic entrepreneurial firms, and just when they are ready for market development, the commercial markets will not invest in them because they are too risky. What happens to these firms in the U.S.? There is a pattern that is occurring throughout the country.

In software and systems integration, there is a rapid escalating trend of big firms coming in and making an immediate capital infusion of an equity investment. The firms, mostly Japanese, expect two things in return. The first is that they get access to the intellectual property rights, technology and know-how. Second, they get the manufacturing rights. One thing we could do immediately in the government with all of the money that is being poured into these new technology development programs is to take the SBIR Program and allow Phase 3 funding. We would establish a proper balance so that the government would not assume all the risk, but enough so that we have some way to finance this critical stage of commercialization.

I would have to have loved to have helped establish SBIR Phase 3 funding in the Bush Administration. Interestingly enough, some States in this country are supporting a lot of innovative programs. California, Texas and Ohio are looking at doing their own SBIR Phase 3 programs. If a company in their state gets federal money for Phase 1 and 2 through SBIR, then the state could provide the third phase, which, in

effect, leverages national and state contributions.

QUESTION, *Mr. Randolph Stayin*: What role do you think the foreign companies that set up plants in the United States or Canada ought to play in this technology development area? They bring technology from Japan. Should they be allowed to be part of Sematech, receiving U.S. funding for research and development? What is your view on that?

ANSWER, *Ms. Wince-Smith*: I do not think there should be any rigid rule one way or the other, that they can or they cannot. It should be looked at in terms of what they would bring to the table that would compensate for them getting access to our research capabilities, talent and a culture of innovation that may not occur in their own country.

I know for a fact that virtually all the significant R&D done by Japanese corporations is not done in the United States in any of their operations here. They have some state-of-the-art manufacturing facilities that have actually been assembled here, but not any of the advanced R&D. And this whole issue of what is a U.S. company, and how you define it, is a little bit of a myth. The Japanese do not have any trouble determining and understanding what a Japanese firm is. Their strategic decisions are being made at their headquarters in Japan, not at their Honda manufacturing plant in Ohio.

Certainly Motorola is a good example for us. Is Motorola an American company? They are a global manufacturer. They have been manufacturing since their very beginning all over the world. But, again, it is at their headquarters in Illinois where they decide whether to pursue a global net for satellite communications or whatever other tough decision is at stake. Those strategic decisions, and how they manage their intellectual property, assets, etc. are being decided here, not in their manufacturing plant in Malaysia. On the other issue, I have yet to see one case where we have any competitive American product, service or industry that has benefitted from an infusion of Japanese technology except in the area of quality and lean production as a manufacturing system. We have ample examples of how the Japanese are increasingly not forthcoming with licensing technology to foreign competition. In the advanced semiconductor manufacturing equipment field, the Japanese hold back new equipment for use in their own internal firms or Keiretsu, for two to three years, before they ever allow such equipment to be marketed to their direct foreign competitors.

What are they going to contribute to consortia besides money? I think money is an essential, but not inclusive contribution. And I have yet to see in my government work — and I have been dealing with Japan on technology issues since 1986 — where the Japanese ever have put their “crown jewels” into a collaborative program with the U.S., certainly not in the FSX program.

My Canadian and European colleagues on the Intelligent Manu-

facturing System (“IMS”) program, have said the jury is now out on these R&D test cases in IMS. They want the Japanese to come forward with their technology assets and, so far, what they are willing to give is nebulous. If they do not contribute beyond money, then what I think is going to happen over the long term, is that the world is not going to tolerate the one-sided type of technology relationship that has occurred with the Japanese for so long.

QUESTION, *Professor King*: I have a question for Dr. Smith. You said that the Government of Canada should ensure a market for the creation of services. How would that work? Would it be ensured government purchasing? How would you decide?

ANSWER, *Dr. S. Smith*: The notion is that the government declares itself open to receive ideas from entrepreneurs regarding products and services that are at the prototype stage and that could be good for government departments. The vendor would have to show that there would be something the government could use but which was not necessarily on the government’s current list of priorities. Certain amounts of money would need to be set aside for purchases that are of value in themselves but where the underlying purpose is one of the industrial benefit.

I also believe that we need an SBIR Program in Canada. I think it is an excellent program and I am very glad that Deborah brought it up.

Regarding the discussion about the Japanese and whether they are really American companies and whether they should be allowed to participate in your advisory committees, we Canadians have to laugh a bit at this. You are talking about maybe one foreign-owned company out of ten that might conceivably sit at a table; we in Canada are talking about a table where nine out of ten companies that might sit are U.S.-owned. So if you are worried about the notion of how you can do some planning when the occasional business is foreign owned, imagine our situation when it comes to manufacturing. There is virtually no sector that is not predominantly American owned.

QUESTION, *Mr. John Howard*: Stuart, I was struck by some of the ambiguities in your comments. But I guess it is necessary coming from Canada. It is true that it is very easy somehow to innovate a product or even some kind of manufacturing process and that it is very difficult to market. Kanetio Mye, in his books, refers expressly to Canada as a good example. It is simply too small a domestic market to have the depth to do any kind of product testing in the marketplace.

A lot of us felt that one of the great advantages of the Free Trade Agreement (“FTA”) and NAFTA was that we would be integrated in a much bigger market and would not have to look for these small niches, that we could specialize in bigger product areas as MacMillan Bloedel has done over a period of time. For example, we have the mills that produced our last two big technological breakthroughs in the lum-

ber industry set up in Georgia and Minnesota. The reality is that the markets are not in Canada, will not be in Canada, and there is nothing government can do in Canada to enable us better to go down and market these products in much bigger markets. So what we have done, as a matter of reality, is form joint ventures that are necessary with the U.S. firms to market it that way. On the other hand, sometimes we have the marketing power and either the U.S., or as in one case, a German firm, joins with us in a joint venture in California. We get their technology, they get our marketing. That is why so many of us favor market solutions to any government intervention in targeting either the innovation or the marketing of it.

You left me with the impression somehow that we should earmark money in Canada, target it to specific products, and even product marketing. Quite frankly, from our experience those are, at best, perverse comments.

ANSWER, *Dr. S. Smith*: That is what every resource company in Canada will say. There is nothing surprising about what you are saying. The problem is, we only have a few large companies and they are all in the commodity business. That is the point. Of course you are big enough to put your plant anywhere you damn well please and nobody is going to be concerned about it. If I go and try to set up a plant from one of my small companies here in, let us say, sewage treatment works, they say, well, have you done it in your own country? If you have not, then we are not interested in hearing from you. Saying we have an FTA, and therefore I should be able to build a plant anywhere in the United States is ridiculous. I am too small. I have got to be able to build my own plant in Georgia on a proven concept. That is not difficult.

My whole point is we do not have big companies in high-value added sectors. When a little niche player comes up with something, he cannot find a big company with whom to jointly enter international markets. Generally speaking, Canada does not have enough big companies in the high-value added sectors, in the electronic sectors in the biotechnology sectors, and so on. It is very difficult for the small Canadian firm to survive long enough to get into the hands of a bigger company that can then do the kind of market development that you need. As far as being able to access a bigger market, all I can say is the whole world was accessing the American market as far as that goes. Everybody and his grandmother was selling in the United States. The issue is, how does having an FTA give us the product to sell today that we did not have yesterday? We were not being prevented from selling our products yesterday. And now today, with the FTA, we are still not prevented from selling our products. So what is the big deal? What I am saying is it does not substitute for having to be represented in a lot of the new industrial areas where we are not now represented. And I

think we have to use government to help bring that about, although I have the same distress that you do about that.

QUESTION, *Mr. Elliott*: I have a question for Deborah. In having served in the Bush Administration, I am very much attuned to the problem of government picking winners. On the other hand, I am a little concerned that we may be sort of organizing to prepare to fight the last war. I hear a lot of discussion, not from you, but from others about the economy of the future being an information economy. I wonder to what extent that is really organizing and preparing for what was successful in the last ten or twenty years.

I recently heard Professor Bromley, who was the President's Science Advisor in the Bush Administration, talking about materials technology in the next twenty years being as revolutionary as computers and information technology had been in the last twenty years.

I wonder if you could say a little more about some of your organizational ideas, particularly vertical integration, and how that relates to organizing for an economy that is going to be based on the five different emerging technologies that we can see, not just the "information economy".

ANSWER, *Ms. Wince-Smith*: The one thing about the information economy or the whole electronics industry and its industrial applications, that is significant and different from the others, is that today whether you are working at the far reaches of biotechnology, developing new drugs, or agricultural applications, the tools of your research and industrial production depend heavily on these information systems. Software programs are being generated in every discipline, whether you are working in advanced materials or an environmental application. That is something that cuts across everything, both as an application and a tool. So in that sense, I think that is what a lot of people refer to when they talk about knowledge-based systems.

If you look at something like the Intelligent Vehicle Highway Systems Program, it gets into the whole area of intelligent vehicles, smart highways, and the whole materials applications and electronics that will be far more important in the next generation car than the building blocks for cars in the twentieth century.

It is interesting, again, if you look at what our Japanese and European colleagues are doing. In the case of Japan, they made an effort early on to get involved in intelligent vehicle highway systems in the U.S. But a big player for them is Sumitomo, not Toyota or Nissan or Honda. Sumitomo is a material producer. The whole value added that is going into future transportation vehicles are in the materials and electronics.

Here is a good example related to Semetech, and why I see fundamental standard failings in these horizontal consortia. Which industrial sectors in the United States are the biggest consumers and users of

semiconductors? The automobile and aerospace industries. But they are not players in Semetech. They have never felt that they have any vested interest in having long-term, stable customized supplies for their critical components. Apparently, they see them as a commodity to be purchased at the lowest price and best quality from any source. That view is unthinkable across the Pacific. If you study the domestic literature that comes from Japan, which is not meant for foreign consumption, Japanese companies present their components needs in terms of "supply lines". What is interesting is that these sets of technologies are transforming the way we now look at current products.

Some years ago, a professor at the University of Arizona gave me important insight in a very simple way. He said that there are only three fundamental ways to create wealth. I think one might want to add a fourth. The first is extracting natural resources. The second is in agricultural production, and certainly the U.S. and Canada are two of the most powerful agricultural producers and exporters in the world. The third is in manufacturing. That is the process of transforming natural assets into value added products that people want to buy. The fourth should be knowledge. It is now a wealth generating element that cuts across all of the above.

I saw a bumper sticker in rural Maryland last summer which had a profound impact on me, particularly because I have two small children. It was on a car and it said, "What are our children going to make?" We have to be a manufacturing nation.