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S. HRG. 102-1083

THE AEROSPACE INDUSTRY

HEARINGS

BEFORE THE

SUBCOMMITTEE ON TECHNOLOGY AND NATIONAL SECURITY

OF THE

JOINT ECONOMIC COMMITTEE CONGRESS OF THE UNITED STATES

ONE HUNDRED SECOND CONGRESS

FIRST AND SECOND SESSION

DECEMBER 3, 1991 AND FEBRUARY 27, 1992

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[Created pursuant to Sec. 5(a) of Public Law 304, 79th Congress]

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THURSDAY, FEBRUARY 27, 1992 [Continued]

McDONNELL DOUGLAS – TAIWAN AEROSPACE AGREEMENT

TUESDAY, DECEMBER 3, 1991

CONGRESS OF THE UNITED STATES,
SUBCOMMITTEE ON TECHNOLOGY AND NATIONAL SECURITY
OF THE JOINT ECONOMIC COMMITTEE,
Washington, DC.

The Subcommittee met, pursuant to notice, at 2:06 p.m., in room SD–628, Dirksen Senate Office Building, Honorable Jeff Bingaman (chairman of the Subommittee) presiding.

Present: Senator Bingaman

Also present: Dorothy Robyn, professional staff member.

OPENING STATEMENT OF SENATOR BINGAMAN, CHAIRMAN

SENATOR BINGAMAN. The hearing will come to order.

This is a hearing of the Joint Economic Committee focusing on the McDonnell Douglas-Taiwan Aerospace agreement. The purpose of the hearing is to discuss the recently proposed agreement to sell 40 percent of McDonnell Douglas's commercial aircraft business to Taiwan Aerospace for $2 billion.

I want to particularly thank Dorothy Robyn with the Joint Economic Committee for the work she's put into organizing this hearing.

McDonnell Douglas reportedly feels that this sale is the only way it can stay in the commercial aircraft business in the face of multiple problems, including growing competition from Europe's heavily subsidized Airbus consortium.

Reactions to the proposed agreement have varied widely. Some call it a logical extension of the kind of global manufacturing alliances that have arisen in aerospace in recent years. Others see in it the seeds of destruction for the U.S. aerospace industry.

My own views on the subject are no secret. In a November 18 letter to President Bush, which was cosigned by 29 of my Senate colleagues, I expressed grave doubts about whether the transaction would be in our national interest. I expressed similarly strong reservations in a subsequent

Senate resolution which has been introduced and cosponsored by 17 other senators.

In particular, I'm concerned about the prospect of transferring a substantial amount of aerospace technology to Taiwan for a small fraction of the cost that it's taken to develop that technology, the majority of which was paid for by the taxpayers of this country.

I'm concerned as well about the impact of the deal on McDonnell Douglas's domestic suppliers, many of whom also supply the Department of Defense, and on U.S. aerospace workers whose jobs may be lost.

I hasten to add that McDonnell Douglas's decision sell to off nearly half of its commercial business is understandable under the circumstances that it faces. It is the circumstances that I object to. Every other large industrialized nation regards its aerospace industry as a strategic industry to be nurtured by a variety of government actions.

The dilemma in which McDonnell Douglas finds itself stems from the complete lack of a strategic U.S. policy on technology, or manufacturing, or trade issues.

Not all of today's witnesses agree with me on this. We have tried to assemble a panel of experts whose views reflect a range of opinions on this particular transaction and more broadly on trade and technology policy. Only in this way can we appreciate the controversy surrounding these important and difficult issues.

The first panel will begin with Mr. Clyde Prestowitz, who is the president of the Economic Strategy Institute here in Washington. He was formerly the counselor for Japan Affairs to the Secretary of Commerce in the Reagan Administration. Also on the panel is David Goodreau, who is president of the Newman Machine Works, which is a Burbank, California firm that supplies precision machine parts to McDonnell Douglas. And also present is Mr. Glenn Plunkett, who is the administrative assistant to Richard Rios, president of Local #148 of the United Auto Workers.

I would say that I've spoken to Owen Bieber, the head of the United Auto Workers, and he has indicated that he is preparing a statement in opposition to the proposed sale as it now stands and will submit that for the record.

So, why don't we start with Mr. Prestowitz and go right across the row. If each of you could take about ten minutes—no more than ten minutes—to summarize your statement, I'll include your full statement in the record, and that will leave some time for questions.

[Press Release, together with attachments, follows:]

NEWS FROM

Jeff Bingaman
U.S. Senator

524 Hart Senate Office Building, Washington, D.C. 20510 • Contact Bill Sandefur (202) 224-1804 or (202) 224-5521

FOR IMMEDIATE RELEASE
November 26, 1991

BINGAMAN INTRODUCES RESOLUTION
ON MCDONNELL DOUGLAS SALE

WASHINGTON -- Senator Jeff Bingaman (D-NM) today introduced a resolution calling on the Bush Administration to investigate the economic implications posed by McDonnell Douglas' decision to sell a portion of its aircraft industry to the Taiwan Aerospace Corporation (TAC). The resolution also calls for an examination of what U.S.-based alternatives might be available to the proposed foreign sale.

McDonnell Douglas, the world's third-largest aircraft manufacturer, announced plans last week to sell 40% of its commercial aircraft subsidiary to TAC for $2 billion.

"The sale of McDonnell Douglas is the symptom of a much larger problem," Bingaman said. "It is the result of disastrous trade policies initiated by the past two administrations which effectively force American firms to take their business overseas. America has already lost its consumer electronics industry and a large portion of its semiconductor business to overseas firms. I don't want our aerospace industry to be the next victim."

The resolution, co-sponsored by more than a dozen senators including Al Gore (D-TN), John Glenn (D-OH), James Exon (D-NE), and Bob Kerrey (D-NE) calls on the Administration to order a 60-day review of the proposed sale by several agencies including the Departments of State, Commerce, Labor, Transportation, Defense, the CIA, NASA, and the Office of Science and Technology Policy as the president deems necessary.

(more)

The resolution calls for:

* A thorough examination of the sale's long-term impact on the health and competitiveness of the U.S. aerospace industry

* A review of U.S. policy toward the support and promotion of the export of U.S. aerospace products and options that would allow McDonnell Douglas to compete in foreign markets against subsidized producers such as Airbus

* Close scrutiny of the options available to the federal government for ending unfair foreign trade practices in high technology products, particularly in the aerospace industry

* A joint investigation, with McDonnell Douglas, its supplier base and other representatives of U.S. industry, into the alternative options available that would preserve high-technology research, development and manufacturing jobs in the U.S. as well as preserve American equity ownership of McDonnell Douglas' commercial aircraft division while maintaining the company as a viable commercial entity.

Investigating agencies are given 60 days after passage of the resolution to submit a report to the chairmen of the Senate Committees on Armed Services and Commerce.

"This is not an attempt to block the proposed sale," Bingaman said. "But it is an effort to confront and change the inept economic policies that forced McDonnell Douglas to pin its hopes for future survival on a foreign government."

Bingaman also announced that the Joint Economic Committee will hold a separate hearing into the sale. It will be held before the Subcommittee on Technology and National Security, which Bingaman chairs, on December 3 at 2:00 p.m. in room 628 of the Dirksen Senate Office Building.

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United States Senate

WASHINGTON, DC 20510

November 18, 1991

The Honorable George Bush
President
The White House
Washington, D.C. 20500

Dear Mr. President:

According to press reports, the McDonnell Douglas Corporation is negotiating with a Taiwanese government-owned corporation to sell a 40 per cent share in its commercial aircraft subsidiary for $2 billion. McDonnell Douglas' board apparently feels that this is the only way it can stay in the commercial aircraft business in the face of an unequal competition with Airbus Industrie, which is effectively owned by a consortium of West European governments.

We would urge you to review this transaction through the Committee on Foreign Investment in the United States (CFIUS). It strikes us that this sale raises the prospect of the transfer of a tremendous amount of aerospace technology to Taiwan (and possibly other Far East equity partners) for a small fraction of the cost it has taken to develop that technology, much of which was paid for by the taxpayers of this country.

We would suggest that the review of this transaction be coupled with a fundamental reassessment of the Administration's trade, technology, and foreign investment policies as they affect the future of this country's aerospace industry. Every other large industrialized nation regards its aerospace industry as a strategic industry to be nurtured by a variety of government actions. It is seen as an industry vital both to national security and economic competitiveness.

The United States government's policy toward the aerospace industry over the past decade has been inchoate. It has consisted of indirect R&D subsidies through the Department of Defense's and the National Aeronautics and Space Administration's research programs and jawboning of various degrees of intensity in our trade negotiations with nations employing direct subsidies of their aerospace industries. This trade policy has been an utter failure, in part because of the high priority other industrialized nations assign this industry, in part because our

government seems to have had higher priorities. Our trade policy has also allowed nations such as Taiwan to pursue mercantile policies and run up huge trade surpluses, with which they now can purchase our strategic industries.

In this context, we understand why McDonnell Douglas' board has decided to seek foreign government subsidies in order to stay in the commercial aircraft business. It was striking to read the comments of Airbus Industrie's Washington spokesman, David Venz, about this transaction. According to the November 16 Washington Post, he said: "This must mean McDonnell Douglas now finds it's appropriate for commercial aircraft producers to have government support." They're just forced to look to the Taiwanese government, not the U.S. government, for that support.

However, we have grave doubts that this transaction would be in our national interest and we would urge you to take the lead in finding a more acceptable alternative. You will recall at the outset of your administration, there was great concern that the FSX fighter deal with Japan would result in an unacceptable loss of U.S. aerospace technology for a small fraction of its value. You moved then to limit technology transfer to Japan, to improve the technology flowback from Japan, and to guarantee a higher United States share in the project should it reach the production phase. After those changes, you won support for that transaction because a majority of Congress felt that the chances that the deal would result in the acceleration of the development of the Japanese commercial aircraft industry had been minimized.

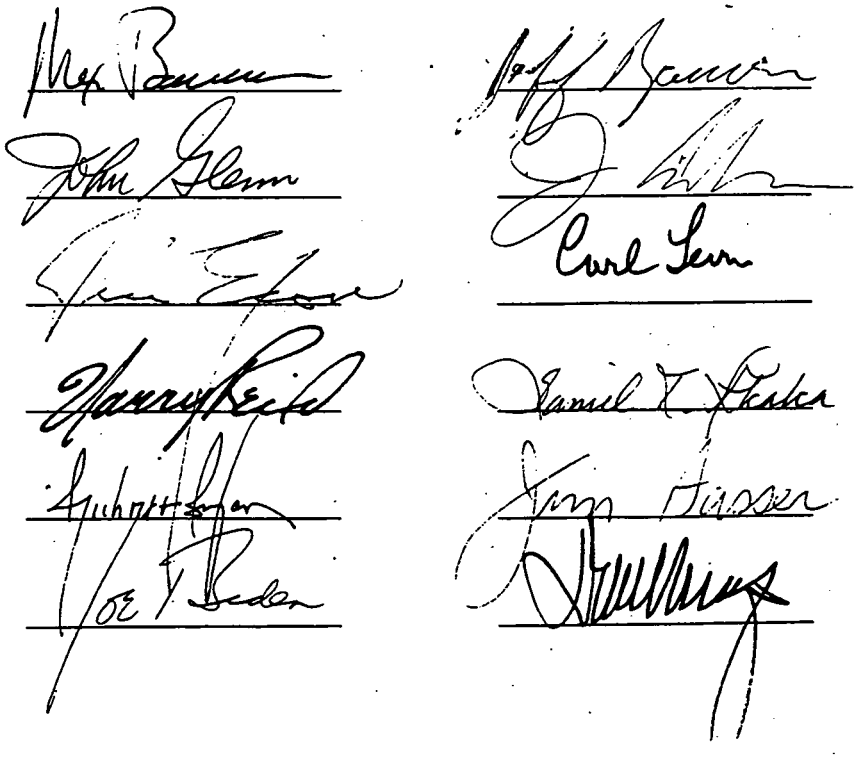
The McDonnell Douglas-Taiwan Aerospace deal raises much more severe problems in our view. For $2 billion the Taiwanese government and its partners will be buying a forty percent stake in the world's third ranking commercial aircraft producer. The equivalent FSX transaction would have involved Mitsubishi Heavy Industries' purchase of a 40 percent stake in General Dynamics military aircraft operations. Obviously, such a deal would not have been allowed to go forward on military grounds. It is equally obvious to us that selling a 40 percent stake in our second largest (and the world's third largest) commercial aircraft producer for a bargain basement price is not in our broader security interests. Such a transaction would be unprecedented and go far beyond the previous transactions Boeing and McDonnell Douglas have had with foreign suppliers.

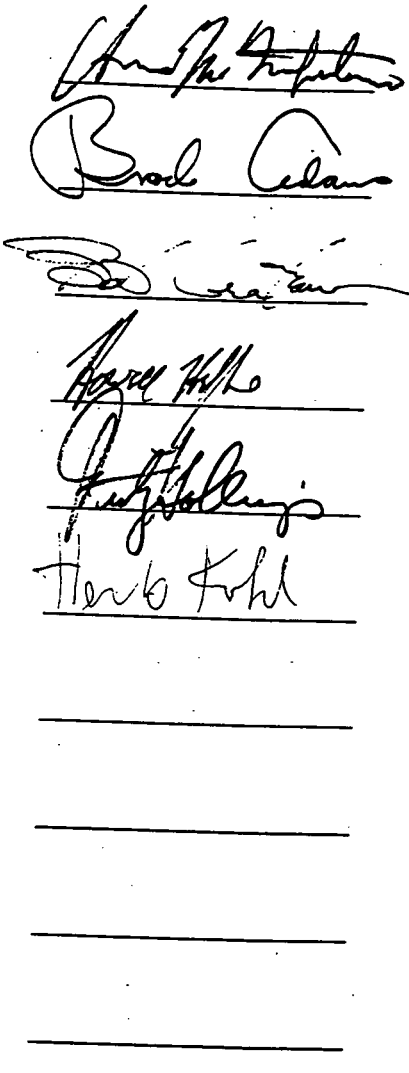
Norm Augustine, the chairman of Martin Marietta, has often remarked that we can not allow our industrial structure to be determined by the industrial policies of other nations. He makes those remarks in the context of the space launch industry, but they are equally apt in the case of the commercial aircraft industry. We would hope that a more rational alternative can be developed by your administration to the McDonnell Douglas-Taiwan

Aerospace deal. We frankly hope that, as in an earlier case when Perkin Elmer's semiconductor manufacturing business was up for sale and a Japanese firm appeared likely to buy it, an alternative that will preserve American equity ownership of McDonnell Douglas' commercial aircraft business will prove possible. One of the defenders of this deal told the Los Angeles Times, the aerospace industry is transforming into "a world of mercantile alliances." If that is true, our government must play as large a role as other governments in determining the nature of those alliances.

Mr. President, we appreciate your looking into this matter. We hope it will provide a catalyst for finally developing strategic trade, technology and foreign investment policies that take into account the real policies of our trading partners, not the policies we wished they had.

Sincerely,





MCDONNELL DOUGLAS LETTER -- SIGNATURES

Bingaman
Adams
Akaka
Baucus
Biden
Bryan
Bumpers
Byrd
Exon
Ford
Fowler
Glenn
Gore
Graham
Harkin
Heflin
Hollings
Kerrey (NE)
Kerry (MA)
Kohl
Lautenberg
Levin
Lieberman
Metzenbaum
Mitchell
Reid
Sanford
Sasser
Shelby
Wofford

(Total 30)

102D CONGRESS
1ST SESSION

S. RES. 234

Expressing the sense of the Senate on the sale of 40 percent of McDonnell Douglas' commercial aircraft division to the Taiwan Aerospace Corporation.

IN THE SENATE OF THE UNITED STATES

NOVEMBER 26 (legislative day, NOVEMBER 23), 1991

Mr. BINGAMAN (for himself, Mr. EXON, Mr. GORE, Mr. GLENN, Mr. BRYAN, Mr. LIEBERMAN, Mr. ADAMS, Mr. HARKIN, Mr. FORD, Mr. DASCHLE, Mr. LEAHY, Mr. DODD, Mr. KERREY, Mr. WELLSTONE, Mr. HOLLINGS, and Mr. ROCKEFELLER) submitted the following resolution; which was referred to the Committee on Commerce, Science, and Transportation

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RESOLUTION

Expressing the sense of the Senate on the sale of 40 percent of McDonnell Douglas' commercial aircraft division to the Taiwan Aerospace Corporation.

Whereas the United States world market position in many manufacturing and high-technology areas has deteriorated in part because of the sale of United States companies with developed technologies to foreign interests;

Whereas development of advanced technology industries, and the aerospace industry in particular, has been vigorously supported by the governments of most other industrialized nations;

Whereas the commercial aircraft industry is regarded as a strategic industry by most industrialized nations and is

directly subsidized by foreign governments to the degree that it is often difficult to separate government from industry;

Whereas McDonnell Douglas has derived benefits for its commercial aircraft program from its contracts with the Department of Defense for research, development, and procurement of military transports, and there are close links between the technology of commercial airliners and of military transports;

Whereas current United States law restricts foreign equity investment in United States airliners on national security grounds;

Whereas Taiwan, in furtherance of its 6-year economic plan to develop and promote high-technology industry, would instantly acquire world-class status in this strategic industry as a part of the world's third largest commercial aircraft firm for an investment of a mere $2,000,000,000, which is a small fraction of the investment already made by United States taxpayers and McDonnell Douglas' shareholders;

Whereas the United States has allowed Taiwan to pursue mercantile trade policies and run a cumulative trade surplus of $100,000,000,000 during the last 10 years, that is now being used to purchase a United States high technology company;

Whereas United States trade policy has allowed Airbus Industrie, a company that receives enormous direct subsidies from European governments for aircraft manufacture in Europe, to compete unfairly with United States aerospace companies and to surpass McDonnell Douglas

and become the second-largest aircraft producer in the world in the 21 years since it was established;

Whereas McDonnell Douglas has suffered gravely as a result of this unfair competition, and United States policy over the past decade has been ineffective in preventing the damage to McDonnell Douglas by Airbus;

Whereas if this proposed sale occurs, up to 60 percent of the manufacturing work on the MD–12 will be done in Taiwan, accelerating the transfer of high-technology manufacturing jobs to other countries over the long term;

Whereas the Exon-Florio law gives the President the power to suspend or prohibit a transaction if such transaction would result in a foreign interest exercising control over a United States company in a manner that might impair the national security of the United States;

Whereas United States foreign investment policy must not ignore serious national security concerns regarding foreign purchases of United States companies and technologies;

Whereas other nations have strategic technology, manufacturing, and trade policies that promote the research, development, production, and domestic equity ownership of strategic technologies and industries such as aerospace; and

Whereas a strong American aerospace sector is critical to the economic security and long-term defense of the United States, and the best interest of the United States can only be served by thoroughly examining the long-term impact of the proposed sale on the United States industrial base: Now, therefore, be it

Resolved, That (a) the Senate has strong reservations about the long-term impact on the United States aero-

space industry, including the supplier base, skilled workers, and technology and manufacturing capabilities, of the proposed sale of 40 percent of McDonnell Douglas' commercial aircraft division to a corporation that is owned in large part by a foreign government.

(b) It is the sense of the Senate that the President should—

(1) conduct a 60-day review of the proposed sale, consulting with the departments and agencies of the United States that he deems appropriate;

(2) examine closely the proposal's long-term impact on the health and competitiveness of the United States aerospace industry, including the supplier base;

(3) examine closely the relationship between the civilian and defense sectors of the aerospace industry, with special attention to the impact of declining defense budgets, including cancellations and cutbacks in research and development and weapons procurement programs, on the industrial base of the United States, on the economic health of dual military-civilian aerospace firms, and on the retention of highly skilled, high-value-added American jobs;

(4) examine closely the proposal's short- and long-term impact on manufacturing employment in

the United States aerospace sector, including at the second and third tier supplier levels;

(5) examine closely United States policy toward the support and promotion of the export of United States aerospace products and options that would allow McDonnell Douglas to compete in foreign markets against subsidized producers such as Airbus;

(6) examine closely the options available to the Federal Government for ending foreign unfair trading practices in high-technology products, particularly aerospace products;

(7) investigate, with McDonnell Douglas, its supplier base, and other representatives of United States industry and labor, available Federal options in areas, including technology policy, manufacturing policy, trade policy, and foreign investment policy, that would preserve high-technology research, development, and manufacturing jobs in the United States, as well as preserving American equity ownership of McDonnell Douglas' commercial aircraft division while maintaining the company as a viable commercial entity; and

(8) submit a report containing his findings within 60 days of the adoption of this resolution to the President of the Senate.

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SENATOR BINGAMAN. Thank you for being here.

STATEMENT OF CLYDE V. PRESTOWITZ, JR., PRESIDENT, ECONOMIC STRATEGY INSTITUTE

MR. PRESTOWITZ. Thank you, Mr. Chairman.

I hope it doesn't contravene the strictures of church and state separation too much to use a biblical reference. But in considering the McDonnell Douglas-Taiwanese deal, it's hard not to think of the story of Jacob and Esau in the Old Testament.

You remember, Esau was the elder brother and had the birthright. Jacob wanted it. Esau was a man of the fields. He came in from the fields after hunting one day, hot and sweaty, and was tired and hungry. Jacob had made him a nice stew, just the kind he liked, and offered it to him in return for his birthright. Esau casually agreed to the deal.

Later, he bitterly regretted it, but it was too late. Their father Isaac could not give the blessing to more than one. He had already given it to Jacob. Esau was left with the consolation prize.

I wonder if we're not looking at a similar story in this particular case. And I might say that the question of McDonnell Douglas and an Asian consortium is not really the only question here. It is simply the latest manifestation of trends in the U.S. economy that have been going on for some time and that are the most disturbing.

In 1916, leaders of the United States concluded that the United States was lagging Europe in aircraft technology. Despite the fact that Americans had invented the airplane and had pioneered early flying, by 1916 the United States was lagging European aircraft manufacturers.

There was a choice, of course. At that time, we could have said, well, this is a field in which the Europeans have a comparative advantage. There's nothing we can do about that. Let's import these nice high-quality, low-cost airplanes from Europe. Or better yet, why don't we simply turn over our aircraft industry to European producers?

But that was not what we did. Rather, we established the National Advisory Commission on Aeronautics—the NACA—with the expressed purpose of catching up to and surpassing the Europeans in aircraft technology to achieve leadership for American industry.

And between 1916 and 1960, that is precisely what the NACA did. In 1960, it was transformed into an organization that still exists—NASA. In response to the challenge of Sputnik, the United States again reaffirmed in the transformation of the NACA into NASA. In the attempt to land a man on the moon, the United States reaffirmed its commitment to leadership in aircraft and aerospace.

So, for 75 years, it has been the declared policy of the United States. It has been a policy that has resulted in enormous expenditures and enormous effort over that period of time to assure leadership in this critical industry for the United States.

And today, in 1991, suddenly, we are seeing a reversal of that policy.

The United States, as you pointed out, Mr. Chairman, is not the only country that has made efforts to achieve leadership in aerospace. The Europeans, in the effort of Britain and France to develop and fly the Concord, the Europeans, in the instance of the Airbus and other military projects. The first Japanese law for promotion of the aircraft industry was passed in 1952. It has been renewed every seven years since then. The Koreans, the Taiwanese and on and on.

The question arises--how is it that we arrive at this situation? And I offer you two quotations.

Not too long ago, one of our leading economists made the comment —potato chips, computer chips, what's the difference? They're all chips. A hundred-dollars' worth of potato chips, a hundred-dollars' worth of computer chips, what do you care? It's a hundred dollars.

In the fall of 1985, in response to the distress of another critical industry—you may recall, at that time, the U.S. semiconductor industry was hemorrhaging as a result of massive illegal dumping of chips in the U.S. market—a meeting was called in the White House to consider what response, if any, to make to that dumping. In the discussion that followed, the then-Deputy Secretary of the Treasury made the comment, "Why do we want a semiconductor industry? We don't want an industrial policy. If our guys can't hack it, let them go."

We have let a number of industries go. Textiles in the 1950s, consumer electronics in the 1960s, steel and autos in the 1970s, semiconductors and now, apparently, aircraft in the 1980s and 1990s.

Now, there are a number of arguments that are made to justify this. One of them is that this is a logical extension of the developments that have been taking place in the industry over a period of time. And that's true. It is a logical extension. But the premise of that argument is that what is logical and logical extension is right. And that doesn't mean, in fact, that the deals that have been made in the past are necessarily the most beneficial deals for the United States.

So, saying it's a logical extension is not necessarily a good argument.

It is argued that we're not going to be transferring anything critical. We're only going to be transferring overseas the commodity end of the business, the low-technology end of the business. We're only going to be transferring the low-wage jobs.

The critical design, high technology and integrating functions will kept in the United States.

I've heard this argument before, Mr. Chairman. I heard it in the case of the semiconductor industry, and in the consumer electronics industry, and in the machine tool industry, and in the robotics industry. We have enough experience now to question the logic of that argument.

It will be said that this is further evidence of globalization, the natural extension of world competition and world markets. And it will be said that if this deal is not done that the whole company will fail. Better half a loaf than no loaf.

Now, in fact, these arguments carry some weight in the view of current circumstances because, while our own government has neglected to concern itself with the long-term future of critical U.S. industries, other governments have not.

So, we have the Airbus, subsidized to the tune of twenty-five billion for the past 20 years, and the Japanese consortium, subsidized to the tune of a billion dollars or more a year. The very group with whom this deal is to be made in Taiwan is 70 percent owed by the Taiwanese government.

It is true that our aircraft manufacturers face an impossible situation. They must compete with companies that can't go out of business in a world market.

And so, in effect, what is happening is that because we ourselves eschew the notion of an industrial policy that the shape of our industry is being determined by the industrial policies of the Europeans and the Asians.

Winners are being picked, Mr. Chairman. It's simply that the pickers are not Americans and, in the long run, the winners are not going to be Americans either.

The question, of course, is what can be done about this? I think the answer is really pretty simple. It is that we hark back to 1916. We hark back to the mentality that prevailed at that time, and ask ourselves the question of whether or not the circumstances that currently prevail are inevitable.

And I submit, Mr. Chairman, that they are not inevitable. In fact, the law theoretically requires the government of the United States to respond to the export subsidies, and the development subsidies, and the dumping of our trading partners.

The U.S. government has not done that. Many of the foreign aircraft being sold in the United States are being sold in contravention of the international trade laws. The U.S. government has done nothing.

It could do something, Mr. Chairman, and the Congress should require it to do something.

Second, why not an American solution? If it's necessary to have a consortium, if it's necessary to have a merger or a joint venture, why not an American one?

I notice that in the course of the Gulf War that the President of the United States called every world leader. He called every leader of the United States. He orchestrated a worldwide alliance to respond to the difficulties in the Gulf.

As far as I know, the President has not called the chairman of McDonnell Douglas, or the chairman of Boeing, or the chairman of Rockwell, or Lockheed, or General Electric, or any of the other major American companies that are involved in the production of aircraft and parts in the United States.

Is it asking too much to expect that the President or, indeed, the leaders of Congress, Mr. Chairman, might convene a meeting of some of

the leaders of the American aircraft industry to discuss the possibility of an American solution, to discuss what the Pentagon might do, what DARPA might do, what the Commerce Department might do, what the Export/Import Bank might do, in order to facilitate an American solution.

The problem, Mr. Chairman, is not that we can't do it. The problem is that our ideology has somehow brought us to the point where we refuse to allow ourselves to see the possibility that we can do it.

It's a very simple question of psychology, Mr. Chairman. It is up to the Congress to effect a change of psychology.

Thank you very much.

[The prepared statement of Mr. Prestowitz follows:]

PREPARED STATEMENT OF CLYDE V. PRESTOWITZ, JR.

Mr. Chairman, I would like to thank you and this committee for the opportunity to testify on the critical issue of the sale of a substantial portion of the McDonnell Douglas Corporation to foreign interests.

I would like to begin with two quotations that I believe lie at the heart of this matter. "Potato chips, computer chips, what is the difference they are all chips?" - current U.S. economic view.

"Why do we want a semiconductor industry? We don't want an industrial policy. If our guys can't hack it, let them go." - Richard Darman, 1985.

To obtain the proper perspective on this statement it is necessary to go all the way back to 1916. It had become apparent to leading authorities in the United States at that time that the United States, despite having invented the airplane, was lagging behind several European countries in development of an aircraft industry. Indeed, the situation was not unlike that which we have seen frequently in recent times in such industries as televisions, VCR's, industrial ceramics, flat panel displays, and others. A technology first developed in the United States is targeted and rapidly commercialized by other countries with the result that international markets are dominated by non-American industry. Fearing the potentially negative consequences of such a development for both the commercial and strategic interests of the United States, the Congress and the President joined together at that time to create the National Advisory Committee on Aeronautics, better known as the NACA.

The mission of the NACA was to achieve world leadership for the U.S. aircraft industry. To this end the NACA was directed to conduct research jointly with industry, to assist industry in commercialization of new technology, and to develop plans aimed at creating a public and business environment conducive to investment in the aircraft industry. The first research facility was quickly established in Langley, Virginia and is still in operation. It was the NACA that did the ground breaking work on early propeller technology, and in many cases it was the NACA that placed initial orders for new equipment in an effort to achieve production volumes sufficient to enable low cost production.

In 1960 the critical mission of the NACA was reconfirmed when, in response to Sputnik and President Kennedy's call to put a man on the moon by the end of the decade, it was transformed into what we know today as the National Aeronautic and Space Administration. NASA's mission, like that of the NACA before it, was to assure U.S. leadership in the air and in space. Not only did NASA undertake the moon and earth orbital missions which have received so much public attention, it also continued to work with the U.S. aircraft industry to assure leadership in commercial and military aircraft. Even as we speak here today, engineers at the old NACA facility at Langley are busy coordinating the work of a consortium of most of the aerospace companies to develop the National Aerospace Plane, or NASP, better known in popular parlance as the Orient Express, because of its potential to fly from Washington to Tokyo in two to three hours.

Thus for seventy-five years it has been the fixed, declared policy of the United States government to bend every effort to assure American leadership in the aircraft industry, commercial as well as military. That policy has been successful. The United States has held leadership in this industry since the end of the second World War, and that leadership has been of immense value. Strategically it contributed immensely to victory in the Cold War. On the economic front, the aircraft industry has consistently been our biggest export industry, contributing hundreds of thousands of high paying jobs. Moreover, technological advances in the aircraft industry have led to advances in metallurgy, electronics, medicine, communications, plastics, ceramics, and a number of other fields. That the United States has been a leader in a number of these areas is due in whole or in part to the dominance of the U.S. aircraft industry.

Another way of measuring the value of this industry and the U.S. position in it is to look at what other countries have been doing to try to catch up. The French and the British teamed up to subsidize development and commercial operation of the Concord. For more than twenty years, the leading countries of Europe have been underpinning development of the Airbus series to the tune of more than $25 billion in subsidies above and beyond those provided to the respective participating companies through military programs. Not to be outdone, the Japanese passed the first legislation targeting the aircraft industry in the early 1950s. Since then, they have used military co-production, direct subsidization of development of both commercial and military aircraft, and subsidization of the subcontracting activities of Japanese companies for Boeing and other U.S. companies to spur development of an indigenous aircraft industry. The Koreans and Taiwanese have done likewise.

It is a measure of how far the rot has gone in our country that which cost our fathers and grandfathers dearly to achieve and that others have made maximum effort to obtain also, we now put on the block for a mere $2 billion. One cannot avoid a comparison with the biblical story of Jacob and Esau. You remember that Esau valued his birthright so little that he gave it to Jacob in return for a mess of potage. Later Esau bitterly regretted his indifference but it was too late. What had been given could not be taken back. Shall we be as foolish as Esau?

An entity like McDonnell Douglas is worth more than the discounted stream of its future dividends and more than the depreciated value of its buildings, tools, and laboratories. I know that is how the smart MBAs on Wall Street and the bean counters at the accounting firms see things. But a business is more than a stock quote or an annual report. It is a productive organic entity with potential for new technology, new products, and even completely new industries. Your can't have a business without people. More than everything else, a company is people. A concentration of the kinds of people and skills and reputation and international network such as that at McDonnell Douglas exists in only one other place in the world and that is at Boeing, another American company. The rest of the world would give its eye teeth indeed has been giving its eye teeth for over thirty years, to have something like it. If we are going to get rid of it at the very least we ought to hold an auction and get the price up.

I know there are many counter arguments in favor of the deal with the Asian consortium. It will be said that only the unsophisticated manufacturing work will be moved abroad. The

critical design, integration, and assembly operations will be kept in the United States. The Asians will do the low cost manufacturing that they do best, and the Americans will do the skilled, high-tech stuff that they do best. An ostensibly perfect international division of labor. This argument will be combined with that of globalization. In an age of growing interdependence, it will be argued, no country can or even should hope to maintain dominance in a large, important industry. Finally, as the clinching argument, it will be said that without this deal the whole company will fail with total loss of all the potential described above. Surely, it will be emphasized, half a loaf is better than none. Indeed those who insist on a whole loaf are likely to be castigated as "bashers", and "protectionists".

Moreover, the people making these argument will be very plausible. Some will be executives from McDonnell Douglas itself. I do not blame them and I will explain why shortly. The company is desperate and, rightly under present circumstances, believes that this solution is its last chance. Others will be former U.S. officials now working as advisers and lobbyists for one or more of the interested parties. But who speaks for the American interest? McDonnell Douglas did not become one of the world's premier aircraft companies all by itself. The American people contributed greatly, and they should have something to say about recent proposals. You the Congress are their representatives, and you must speak for the people, not the interests.

The arguments are mostly wrong. How many times in the past have we heard that one or another U.S. interest is only moving the low end work and the old technology overseas. Remember when it was black and white television and we were told not to worry because the sexy stuff was color television and we were going to do that in the United States? Remember when it was semiconductors and we were told not to worry because it was only old technology that was being licensed? The Asians, it was said, were light years behind. They would never catch up. Indeed, the arguments have an all too familiar ring. Already one hears in connection with the proposed deal, that in the modern age technology cannot be protected. The only solution, it is said, is to move faster, out innovate, out develop, and out commercialize the competition. Perhaps the aircraft people should talk to the semiconductor industry. It is very difficult to out innovate, out develop, and out commercialize when the other guy is spending twice as much on R&D and investment and has a high priority government development policy behind him.

The globalization mantra has become particularly seductive in recent years as the United States has experiences rapid and broad scale industrial reverses. It is soothing to see these not as reverses but as the inexorable working of history and even as evidence of progress. But we should ask ourselves why globalization always seem to involve selling off American interests or moving American technology and jobs abroad. The Europeans have steadily reduced the percentage of the Airbus supplied from the United States, and surely the Japanese are not about to offer a piece of Mitsubishi on the alter of globalization. In fact, globalization is a euphemism for American decline and even for colonialization.

Then there are the jobs. We are only going to move the components manufacturing jobs

to Asia. There is something wrong with this for two reasons. First, the Asians want this deal because they think they can use it to get good jobs and eventually to move up to full aircraft manufacture. Either the Asians are wrong or the Americans don't get it, and in light of past experience it is difficult to bet against the Asians. Second, one has to ask what is wrong with having some manufacturing jobs for Americans? We have a stagnating economy with a loss of precisely the kind of high wage manufacturing jobs the aircraft industry provides. Do we want to get rid of more of these jobs? In other instances, it could be argued that there was no choice because our manufacturers were facing low wage Asian competition in their end product markets. Thus, U.S. producers, it was argued, had to have the same kind of manufacturing costs to remain competitive. But here, there is no low wage competition. Outside the United States, the only major aircraft manufacturers are European and their wages are higher than in the United States. Some might argue that low wages are necessary to offset European subsidies, but it is not possible to obtain wages low enough to do that. It might also be said that low wages would help McDonnell in its competition with Boeing. That is a fair point, but that is where the McDonnell interest and the American interest may diverge. The great benefit of having dominance in a major industry is precisely that it enables a nation to compete on something other than low wages. That has traditionally been the difference between the United States and countries like Bangladesh.

The half a loaf is better than none argument is superficially attractive and has some validity under present circumstances. The weakness is the implicit assumption that those circumstances cannot be changed. This is not, in fact the case.

The circumstances are the combination of the European Airbus policy with the industry targeting policies of Japan, Taiwan, and Korea, and the lack of any policy in the United States save for a rigid anti-trust policy. One can easily have sympathy for the fix in which the executives the McDonnell Douglas find themselves. On the one hand, the Europeans have demonstrated that they are prepared to do whatever it takes to grab a large share of the international aircraft market. The Airbus will not be allowed to fail, and its airplanes will be sold in world markets at whatever prices it takes to win. Faced with this competition, Boeing has teamed up with the Japanese. This is not entirely because the Japanese are good at manufacturing. Rather it has a lot to do with the fact that the Japanese government is subsidizing Boeing's Japanese partners and thus indirectly subsidizing Boeing. Moreover, it is an implicit part of the deal that Japanese airlines, Boeing's largest single customers, will continue to buy Boeing. Thus, McDonnell Douglas faces competitors backed by foreign industrial policies in all arenas. The U.S. government has demonstrated over the years that it will do nothing, preferring the "magic of the market". For instance, every Airbus sold in the U.S. market is being illegally dumped. Yet the U.S. government has taken no steps to enforce its own trade laws. When a proposal was made to do so in the fall of 1985, then Secretary of State Shultz strongly opposed any action on the grounds that NATO would be at risk. In these circumstances, it is, perhaps, not surprising that McDonnell Douglas should seek to ally itself with another government that has an industrial policy, in this case that of Taiwan.

But these circumstances are not ordained from on high. They arise from the rigid

adherence of successive U.S. administrations to the narrow, ideological doctrine expressed in the quotes at the beginning of this testimony. The notion that potato chips are the same as computer chips and that we don't want an industrial policy even if it means letting our guys go is inhibiting us as if it were one of the ten commandments. It is not. No other country in the world with the possible exception of Great Britain, whose performance in these matters few would want to imitate, believes in this nonsense. Certainly the other Europeans do not and neither do the Japanese, Taiwanese, or Koreans. Indeed, for fear of having an American industrial policy we are going to have the shape of our aircraft industry determined by Taiwanese, European, and Japanese industrial policy.

We have seen the results of such developments too often in the past in the cases of such industries as consumer electronics, computers, semiconductors, ceramics, steel, autos, and many others. This time let us not be squeamish. We have had an industrial policy for aircraft for seventy-five years. It is not un-American. If a winner is going to be picked, let it be an American winner picked by Americans.

I have been asked how we can do that. Simple. The leaders of Congress and the President should call in the leaders of the U.S. aircraft companies along with the leaders of other related industries, such as jet engines, computers, semiconductors, telecommunications, avionics and so forth. Industry should be told that the government of the United States prefers a domestic solution and will work to help achieve one. The anti-trust laws should be waived in this case and an American consortium established. The industry has experience with this in the NASP project as well as in virtually all military projects since the beginning of World War II. It is not un-American. The U.S. Trade Representative should inform the Europeans that Airbus sales in the United States will be subject to a countervailing duty until such time as the European subsidies cease. Moreover, the Department of Commerce and the Export/Import Bank should be given war chests sufficient to offset Airbus subsidies to foreign customers. The U.S. government should further review NASA and Defense contracts with the U.S. industry to avoid taking steps that might further undermine its financial viability.

In effect, the U.S. government should hold to its policy of the past seventy-five years of ensuring U.S. leadership in the aerospace industry. If we do so, our grandfathers may still be assured that it was not all in vain.

SENATOR BINGAMAN. Thank you very much. Before I ask any questions, we'll just hear from each of the other panelists.

Mr. Goodreau, why don't you go ahead?

STATEMENT OF DAVID GOODREAU, PRESIDENT NEWMAN MACHINE WORKS, BURBANK, CALIFORNIA

MR. GOODREAU. Thank you, Mr. Chairman.

I want to thank you on behalf of our organization, the National Tooling and Machining Association, and the California members. We appreciate your concern during this busy weekend.

There are a lot of concerns that manufacturers have about the sale of McDonnell-Douglas. Our membership was really concerned and almost outraged from the beginning, as far as envisioning the initial implications behind this sale. Not only losing the work of McDonnell-Douglas, which is very big in our area, but also the concern of losing what many consider a national treasure, and the pride that we put into our aerospace industry in California and in the nation as a whole.

So, it's a two-fold-type-of-thing. After the initial outrage that we had, people started calling me back and were truly shocked at what this really meant.

As much as this is talking about the Douglas merger, we're talking about our national policy and the effect this will have on the little guy, which is us. We're concerned about these two areas—the Douglas Sale and National Policy—but at the same time, speaking as one of those people that would like to partake of that half a loaf—Douglas— we're concerned about the work, too. Sometimes we feel as though half of Douglas is better than no Douglas at all.

After I read an article about John McDonnell, as far as becoming a family business, which I can definitely understand and relate to, here's a little guy like Mr. Mac who grew into the company that they are at right now.

My company has the same problems. I want to grow. I want to feed my family. And so we're faced with a dual-edged sword here. The small manufacturer wants what's best for his customers as well as what's best for his company.

The point of interest that I'd like to bring up is basically: How our industrial policy is affecting my family and the people that are just like my company, because we are truly at the heart of manufacturing in our country. Sometimes I think that the manufacturing industry doesn't get their due as far as what we do for this country.

We're faced with industries relocating, whether it be to other states, or whether it be out of the country—Mexico, Taiwan—whatever it might be. The small guy doesn't have the opportunity to do the marketing once a company has left the state or the country. That's really a problem.

The production quantities that we're used to doing is dropping. Because of the high expense of the military, commercial and foreign offset

programs, we're really being hurt from lower volumes of work than we're normally doing. This sale is going to do nothing but hurt that situation further.

Manufacturing is being redefined. One of the things that got Douglas in this position in the first place was the redefining of what quality is and how it's going to be done in our manufacturing plants. I feel for them because I've gone through the same thing. It's not easy to gear up for this global type of manufacturing environment that we're going to have to face.

Our manufacturing base is being consolidated over two areas. Number one, it's being consolidated because of this restructuring in our industry, and, also, it's being consolidated because there's just not enough work.

SENATOR BINGAMAN. Would you say that again?

MR. GOODREAU. OK. We're having a problem because our subcontractor base is being consolidated through two areas. The first is through the reconstruction going on in our industry, as far as quality management, zero defects, and "just in time" types of manufacturing. This is separating the men from the boys at this moment. Many shops have not reacted to these innovations.

Second, is from a lack of work. If companies—Boeing sending offset programs to different countries, Northrop to Switzerland, or wherever it might be--these are components that we're not making and, subsequently, our members are not having an opportunity to manufacture them.

We're also having trouble finding competent help. That's another one of the reasons why a company like Douglas is having problems. It's tough to find trained people. Manufacturers are having considerable problems getting financial institutions to believe in us. Manufacturing is not a glamour industry, and it seems to me someone will finance a donut stand far quicker than they'll finance a machine for some average Joe who wants to take a crack at it. And obviously this is a problem that Douglas has had, too, trying to find financing.

As I said in the beginning, people started calling me back regarding the sale, screaming at us that there has been a lack of helpful leadership from the Congress, from the President and from state and local governments. At the present rate, how in the world are we going to survive in the 1990s and on into the year 2000? How are we going to address this problem to where I have an opportunity to provide for my family by manufacturing, and so my son can take over my business, just like my brother took it over from his dad, all the way down the line? How are we going to make sure that we have the opportunity to continue in this line of work?

At this moment, I see no leadership. If we need to go overseas to form consortiums, which, as far as I can tell, is something that's eventually going to have to be done, what's the rhyme? What's the reason? Where are we going to be? What do we want to accomplish when we get there? How are we going to make sure that our country is at the forefront of this technological revolution that's going on in a global atmosphere?

It's really a no-win situation. Douglas has to stay in business for their people, for their company. There are hundreds of small shops in just our area that do work with Douglas, and I know that they want to continue doing work with Douglas.

At the same time, we have the possibility of forming something like a government-industrial coalition to put something together to help Douglas out.

One of the things that Douglas would like to do is gain Asian market share, and in all fairness to them, Boeing has already accomplished that goal. The 777 program will have close to 20 percent going overseas. There was even an article in the paper talking about how Boeing wants to come out with a plane that will directly come in competition with the MD-12. And where did they announce it, but in Korea?

Doulgas did not create this situation of seeking foreign financial partners. This is something that's been there, something that's going on as we speak. And there is no rhyme and no reason, no control over it.

So, we would like to see intervention by the government and industry to look at the options available and to maybe put the skids on this type of activity.

The heart of the matter, as far as redefining this symptom and looking at the underlying problem, is for us to become more competitive on a national basis, to where our country is able to compete side-by-side, step-for-step; hopefully, one step ahead of what our global partners and competitors are doing.

One way we can do this is by adopting international quality standards so that there is a conducive way of putting together joint action by our manufacturing and legislative bodies to create a current industrial policy. Something that gives us leadership.

Then, we need to go back to the drawing board and look at education. The only way that we will become competitive is to put pride back into our educational system. We need programs where people can excel in industrial learning. The present system assumes that the worst students are going to industrial classes; whereas, the best students will graduate and enter college. Educators need to establish a new pride in manufacturing in our nation's schools.

A joint industrial-legislative commission on standards, to create common industry and military requirements is critical to an industrial policy. In my office, I have standards, three to four books long, from each of my prime customer's. Every customer has their own way of doing things. And if we're talking about prospering in a competitive market place—a global arena—we need to start standardizing things so that we just have one set of manufacturing standards to deal with. The Europeans have already done this. We're talking about a very, very difficult process. But from the standpoint of the benefits, it's something that needs to be looked at.

We have two areas where we need leadership. One is the legislative branch, the other is the Department of Defense. From the standpoint of

streamlining documentation and helping our industry become competitive again, this leadership needs to come from the Department of Defense. In the aerospace industry, we work to their standards.

Reduction of unnecessary regulations and paperwork is another item. We need to look at one of the problems that's very near and dear to the hearts of Californians, and that is the legal problems that we're having with heavy claims, fraudulent claims, and very, very high settlements in the area of workman's comp. Also, the high cost of medical insurance.

All these areas are literally killing our ability to compete. It doesn't matter whether you're in California or Massachusetts—wherever you are—insurance and the problems with legal claims and settlements is really hurting business people.

I'd like to say that, just like McDonnell Douglas, we're manufacturers, too, and we need help. Not just money from foreign investors, but we need dynamic leadership, protection and direction from the United States Congress.

As a representative of the small manufacturer, my organization, NTMA, and members such as myself, we're dedicated to assisting our representatives at both the state and federal level in finding solutions to these difficult industrial problems.

Thank you.

[The prepared statement of Mr. Goodreau follows:]

PREPARED STATEMENT OF DAVID L. GOODREAU

A few weeks ago, I received a newsletter from the Los Angeles Chapter of the National Tooling and Machining Association. Inside the newsletter was a single sheet entitled "Economics On A Page." This sheet informed the reader that a society's wealth can come from only three root forms: agriculture, mining or manufacturing. I have seen many magazine and newspaper articles showing a miner outside his home somewhere in West Virginia or Pennsylvania, fighting for the economic stability of his home town or his health. I've also heard Willie Nelson sing about the American family farm and I've given my small share to help their cause. But what have we heard from the American small manufacturer? Permit me, please, to introduce you to one such family.

In 1939 Newman Machine Works was started by my brother's father and our mother. Through the years, it fluctuated from a one man company to 35 people, depending on the economy. My uncle started his company by subletting space from our company and today has two corporations employing approximately 600 employees. His son owns a small job shop and taught me about modern machining technologies while I worked as his foreman. And yet another industrious uncle owned a small tool and cutter grinding company for almost 50 years. My father owned a small manufacturing company for a few years. When my brother Gene was nine years old, he stood on a wooden fruit crate, and Dad taught him how to run an engine lathe. Gene eventually took over the business and spent his time and money cleaning up and improving the manual equipment. I started in the machining trade at age 16 and worked at Newman off and on for 5 years prior to buying my own automated equipment which eventually was brought into Newman Machine Works to update the equipment to modern technology. I have spent the last 12 years continuing a family tradition. My family, like the family farmer and the small-town miner, has a proud tradition. Unlike the farmer, our environment is not the great outdoors of the vast heartland; but inside manufacturing plants all across our great nation. Here, man and machine are working together to create safe and comfortable working conditions and striving to create the competitive and quality needs of an industry in radical transition. This is where machinists of old learn to be businessmen of tomorrow; learning the high tech techniques of cutting-edge equipment and coping with the demands of a new quality-conscious environment.

Today, we are here to question whether the proposed sale of 40% of McDonnell Douglas to Taiwan Aerospace is in the national interest. My initial reaction to this question is whether the security of my family's business and that of thousands of other small manufacturers, who are captive to defense, aerospace, machinery and computer hardware industries, are critical to our national interest.

As aerospace suppliers, we are concerned that the sale of 40% of McDonnell Douglas to Taiwan Aerospace will have the effect of diminishing subcontract work presently being performed in the U.S. It is our understanding that a substantial amount of parts manufacturing for the new MD-12 will take place in Taiwan which means that work which ordinarily would be accomplished by the

subcontract network in the U.S. will no longer take place. In an already recessed economy, such loss of work will result in business closings, lay offs and increased unemployment. This loss, coupled with the significant impact it will have on the shrinking of specialized and skilled labor pool, will contribute further to the build-up and reliance upon foreign skills. Because of the relatively high value added work performed by our tooling and machining specialists required by exact aerodynamics precision, the inducement for McDonnell Douglas to move this effort offshore to cheaper labor markets is great. However, skill in itself is technology, and loss of skill is loss of technology. Therefore, even though McDonnell Douglas maintains that it will separate its commercial business from its military sales, the supplier base is not so easily segregated. The men and women in tooling and machining shops often do not know whether the part they are producing will go on commercial or military aircraft (it may go on both). In that sense, there is not a defense industrial base in this country, but just an industrial base, a portion of which supports defense requirements. Therefore, does this sale effect national security? In our opinion, yes it does. Because of the short sighted strategies of corporate America and the unacceptable leadership of our federal, state and local governments, we have watched the other industrialized countries of the world invest in an industrial tomorrow. One by one we have watched the important technologies fall into foreign leadership.

U.S. aerospace suppliers have already been severely impacted by foreign competition among OEMs (mostly from Airbus Industrie), by defense spending cuts, by distress in the airlines, and by "offset" arrangements with export aircraft buyers. The domestic commercial airliner business is now down to only two companies -- McDonnell Douglas and Boeing. Permitting nearly half of McDonnell Douglas' ownership to go offshore can only yield further adverse impact to the supplier base. This move would unquestionably place significant additional defense dependence upon foreign sources.

If strategic commercial technology can be described in the aviation industry as that which gives a company competitive advantage through high quality and low cost, then, our conclusion is that McDonnell Douglas in particular, and U.S. aviation in general, is at risk. Although the U.S. remains the world leader in commercial aviation, this position is subject to challenge. Airbus Industrie is now number two. Given the past history of Taiwan and its lackadaisical attitude towards patents, copy rights and proprietary data, a certain queasiness occurs at the mere suggestion of the release of such information. It must be remembered that the Taiwanese are also talking to other countries, both in Asia and Europe, concerning joint ventures in the aircraft industry.

At present, it is our understanding that if this sale is approved, various components of the MD-12 would be manufactured in several countries in the Far East or Asia and brought together in Taiwan for subassembly before shipment back to the U.S. for final assembly in a facility yet to be determined (or at least announced). Our further understanding is that Taiwan Aerospace is less than 3 months old and has never produced anything and that there does not now exist in Taiwan any network of aircraft suppliers with a skilled workforce. It would appear that one of the purposes of the Taiwan government in funding this venture is to establish such a base. If that is so, with a view toward the expected aircraft boom in Asia in the coming decade, the Taiwanese will have made an excellent investment. With available capital in excess of $40 billion, there will be incentive for further investment. With a declining U.S. military budget occurring simultaneously, these forces could easily work together to create further opportunity for foreign investors to acquire more ownership of McDonnell Douglas and perhaps other U.S. companies as well. If U.S. venture capital is available only for short term investment returns, there is no reason to believe that foreign acquisition will not continue and expand.

Even if our industrial base wants to play the global market and create a free flow of technology to benefit mankind, we have not drawn up a current road map to protect our interests and chart our progress. This 40% sale of McDonnell Douglas reminds me of a Twilight Zone episode where we as a nation have been naive and willingly sold our souls to the Great Foreign Investor, who has promised us a ridiculous amount of money for our corporations and technologies. Only after selling out to him do we find out it was the devil himself, and he has used our own greed to eternally torment our financial souls. It may be unfair to my customer Douglas Aircraft for all this sudden interest in foreign intervention and investment, because this has been going on for many years. But it is not unfair to expect the Congress to quickly decide how we are going to proceed down the road to regain our global dominance in the industrial arena.

Foreign investment and work offset programs such as this will continue to change my industry. They will add to present trends such as smaller manufactured quantities, intense competition from both domestic and foreign firms, total quality management environments, smaller vendor bases, rising federal and state regulatory costs, lack of qualified personnel, excessive insurance costs, and the rising costs of employee benefits. All these requirements have succeeded in putting a great many of our smaller manufacturing companies out of business. Add to these trends the continued loss of work through business relocations to cheaper labor markets and it begins to paint a bleak picture for our immediate future. What this leaves us with is a national small manufacturing base that is lean and efficient. This sounds good for the manufacturing companies which survive the transitions. They will have higher sales volumes from a smaller

customer base. However, should there be a national security need to draw upon the resources of this manufacturing base for a sudden national emergency, the man hours available from this lean industrial base will be far short of that necessary to fill defense requirements. Additionally, in my opinion, it would cause considerable delays to commercial products presently manufactured, and would result in serious harm to our economic strength.

The impact of this proposed sale on employment will only continue to destroy the technological expertise, ingenuity, and depth of our labor resources and cause additional strain on our already fragile economy. It is also important to note that because of mergers such as this, we are laying off the manufacturing experts who would, and should, be training the next generation of young people. It seems to me that the ultimate waste of our tax dollar is where we invest billions of dollars in defense projects which educate and mold our manufacturing personnel, and then, instead of cashing in on our investment through the inheritance of training, we sell this inheritance to a foreign investor to pass along to his industrial base.

How could these types of mergers cause anything but an accelerated transfer of our strategic technologies. I am reminded of the complex engineering/production control system which Northrop and Boeing have developed to create paperless manufacturing systems. This state-of-the-art system is going to be used to help build the Boeing 777. Do you think that the Japanese investors who have purchased 20% of the 777 program will be using this state-of-the-art manufacturing aid that was paid for by the American tax dollar? The typical foreign investor differs from our own domestic investor, in that their focus is on the potential of the process rather than the present worth of the process. American investors have abandoned corporations such as Douglas Aircraft and their future product, the MD-12. Based on the current government policy which is in favor of non-restricted global teaming and the intense competition for survival by all branches of American manufacturing, the only way I can perceive an unfair advantage being obtained is if McDonnell Douglas did not pursue this venture. I believe that the question we must ask is whether this deal, along with Boeing's plans to include foreign investors or new projects, places the American industrial base in jeopardy. Because of the massive expansion in the Asian, Latin, and European markets, will the American small business owner be included in these deals to ensure our future? Who is protecting our interests in these business ventures now that corporations such as Ford Motor Company has announced its allegiance to the global economy and will not be accountable to American manufacturing interests?

The question has been raised about the transfer of sensitive defense technologies. If you consider that the bulk of these technologies are created from the investment of defense dollars,

it seems likely that the foreign investor would benefit from these technologies. By foreign investment in a company like McDonnell Douglas or Boeing, it would place them closer to personnel who may have had access to classified technologies thus increasing the likelihood of compromise.

The question of "dual-use" technology is a significant one in this issue. Recently, Administration pressure cancelled a 40% buy-in by Fujitsu Fanuc, a Japanese maker of computer controls for machine tools, into Moore Special Tool Co., a Connecticut machine tool builder, on grounds of dual-use.

Taiwan Aerospace is only a few months old and has no manufacturing experience. Its capital has been raised from the R.O.C. government and private Taiwan corporations. Taiwan Aerospace is reportedly discussing a joint venture with the French government-owned aircraft builder, Aerospatiale. The PRC has objected to U.S. sales of military aircraft to Taiwan, yet General Dynamics is working to help the Taiwan Air Force develop its own fighter. McDonnell Douglas is involved now in a project to build two jetliners in the PRC.

The technology of commercial aircraft manufacturing differs little from that of building military aircraft. American aircraft for both military and commercial use are already dependent upon Asian sources for components of systems for avionics, communications, and weaponry.

Placing all of the McDonnell Douglas commercial work abroad would result in a likely situation of military aircraft of the same design family also being made abroad. A case in point is the KC-10-A tanker, which is based on the DC-10/MD-11 structure. Overseas facilities to build large aircraft would also be logical manufacturing sites for the McDonnell Douglas C-17 military airlift plane.

Crossovers of technology applications among military and commercial aircraft made by the same builders are well-documented and are characteristic of the industry. McDonnell Douglas is involved in a number of U.S. military programs, including the Air Force MLV military satellite launch vehicle as well as NASA's National Aerospace Plane and space station programs. McDonnell Douglas has military commitments for the Navy's F/A-18, T-45, and Tomahawk missile; and for the Air Force's C-17 and cruise missile programs. The company is also the source of the F-15 Eagle, AV8 Harrier, the F-18 Hornet, and the KC-10-A tanker, none of which are presently contracted for U.S. military purchase. McDonnell Douglas is additionally the manufacturer of the AH64 Apache anti-tank helicopter for export.

McDonnell Douglas is said to be the biggest single U.S. defense contractor, yet the company cannot find an adequate source of capital at home to retire debt and to develop its next-generation

airliner, the wide-body MD-12. We believe that the proposed 40% buy-in by a foreign newcomer presents serious questions about security of defense technology and about availability of emergency production capacity.

Any loss of managerial control by an American company to foreign control could possibly alter the type of work which American industries are allowed to do. The competitive price which we offer to our customers, in spite of unfair foreign purchasing policies, combined with the amount of offset work to the investor's country, are increasingly serious problems.

An article in the November 23, 1991 issue of The Economist states that the company intends to use the Taiwan Aerospace investment to help retire its $2.7 million debt load, and to rely upon revenue from the sale of other aircraft to develop the MD-12 wide-body airliner in Asia.

In July 1991, aerospace industry analyst Thomas Vild told NTMA members that McDonnell Douglas had ruled out its Long Beach, California plant as a site for the MD-12 program. Sites reported under consideration at that time included Salt Lake City, Tulsa, Shreveport, Kansas City, Mesa, and Houston. Today, McDonnell Douglas says that the MD-12 will not be made at all unless the Taiwan Aerospace deal is consummated.

Presently, 60% of the MD-11 structure is made by partners and suppliers to McDonnell Douglas. Even before the proposed deal with Taiwan Aerospace, 90% of the MD-12 was expected to be provided by partners and suppliers.

Even Boeing, as the world's leading commercial aircraft builder, has 20% of the development of its next-generation 777 airliner committed to the three leading Japanese aerospace companies, Mitsubishi, Kawasaki, and Fuji, adding another dimension to control and likely erosion of U.S. leadership in commercial aircraft. McDonnell Douglas is losing market share to Airbus Industrie, now the number-two producer of commercial jetliners. At the same time, McDonnell Douglas' military sales are expected to decline over the next five years or so. If sales do not permit a sustained effort by McDonnell Douglas to develop the MD-12 with its Asian partners, the company would likely be taken over by the Asian investors supporting Taiwan Aerospace.

Another concern is not merely of foreign ownership and control, but that in this case, a large share of the foreign ownership will be by foreign governments. Both the Taiwan government and the ruling Kuomintang party are heavily invested in the Taiwan Aerospace proposal. Singapore Aerospace is primarily owned by the government of Singapore, and is said to be eager for involvement in the proposed McDonnell sale. It is sadly ironic that our largest defense contractor must go halfway around the world to find government incentives for development.

While Singapore has a reasonably well-developed aerospace infrastructure, Taiwan has little in this respect. A significant, time-consuming effort in skills training and manufacturing capacity build-up must take place to permit Taiwan Aerospace to manufacture planes in Taiwan. The ability to learn and meet stringent industry and FAA standards for quality, reliability, and safety are major concerns in this regard. How many Americans would have enough confidence to board their families onto an airliner bearing a "made in Taiwan" label?

The intent of having major components and subassemblies delivered to the U.S. for final assembly also reflects a disturbing trend. Assembly is the kind of low-skill, low-wage, low value-added work that industrialized nations have traditionally farmed out to less-developed countries. This trend has been clear among the many Japanese companies that now have assembly facilities in the U.S., especially in the automotive industry.

The mention of acceptable alternatives seems rather removed given the circumstances of McDonnell Douglas' financial and management struggles, the current recession, and the failure of our financial community to support American investment. Perhaps a business, labor and Congressional coalition could be put together to offset the risks involved in developing a new program. It should be noted that alternate methods are only possible if American policy is designed so that fairness is obtained and increased competition against global threats are achieved.

In order to better serve the critical needs of American manufacturing, the following is suggested:

-- Adopt international quality standards such as ISO 9000. The importance of ISO-9000 is that during the manufacturing process, it serves as an international standard which is used to define the quality process and how it should be interpreted by production control. It has outdated MIL-I-45602A and Mil-Q-9858 by designing quality into the process rather than inspecting quality in the final product. The U.S. will never be able to compete globally without adherence to ISO-9000.

-- Together, with industry leaders (both large and small business), Congress and the President need to quickly develop a long range plan which can be reviewed annually. It should include defined milestones and guidelines to guide our country back to industrial superiority.

-- This policy should include as its cornerstone the restructuring of our educational systems and include within this process the rebuilding of our industrial arts programs. The importance of manufacturing must come from the President and flow down to the teachers who in turn will instill pride into our young people. This process of education is the most

important investment we can make in our dreams of tomorrow. The finest machinists, engineers and technicians need to be recruited at top pay to revitalize these noble and profitable occupations.

-- We need to bring U.S. industries together to find common ground in the creation and interpretation of specifications and processes in order to become globally competitive.

-- The Department of Defense needs to lead the way for massive reorganization to create the example for a restructuring of the regulations and paperwork presently clogging the veins of the defense/aerospace corporation.

-- Lessening the regulations and paperwork is necessary to do business within the aerospace and defense industry; and increase penalties for infractions to such levels that it will hurt the company, not slap their wrist. Penalize the guilty not the hard working businessman.

-- We need federal intervention into the excessive liberties which the legal community is enjoying in pursuit of the almighty dollar. Unrealistic lawsuit claims of outlandish settlements are ruining our industry and our country.

Thank you. This concludes my statement.

SENATOR BINGAMAN. Thank you very much for the testimony, and I'll have some questions after we hear from Mr. Plunkett.

Go ahead, Mr. Plunkett.

STATEMENT OF GLENN PLUNKETT, ASSISTANT TO THE PRESIDENT, UNITED AUTO WORKERS LOCAL #148

MR. PLUNKETT. To begin with, I'd like to thank you, Senator Bingaman, for permitting us to speak here today and for showing an interest in this matter.

My name is Glenn Plunkett, and I am administrative assistant to Richard Rios, president of Local #148 of the United Aerospace Workers—the UAW.

I'm here on behalf of President Rios and the almost 20,000 employees of Douglas Aircraft Company, represented by Local 148 in Long Beach, California. There are approximately 47,000 employees of Douglas in Long Beach, a facility that has been in existence since before World War II, and men and women of our union are among the highest skilled workers in America.

We have built a whole line of commercial and military aircraft. Today, we build the MD-80, MD-90 and the MD-11. We want to build the MD-12.

We have done our jobs in war and in peace for our country, for Douglas, and for our families.

Long Beach is not the only Douglas facility in this country. Douglas also maintains facilities at Torrance and Huntington Beach in California; Tulsa, Oklahoma; Melbourne, Arkansas; and Columbus, Ohio.

If this joint venture is permitted to go forward, over a short period of time, most of the jobs at these locations will be lost.

For the City of Long Beach, as well as most of these communities, the loss of these jobs will be devastating. The loss of employment will expand to employees of suppliers of Douglas, as well as the businesses which are supported by the tens of thousands of employees who are employed by Douglas and live and work in the community.

Among the major companies that will be seriously jeopardized by the loss of these jobs is General Dynamics, which, at its San Diego Convair facility, performs work on Douglas airplanes that will be almost completely lost as an immediate result of this joint venture.

The work they currently perform on the MD-11 is the same work Douglas plans to have done in Taiwan on the MD-12.

We are best qualified to speak about this direct and immediate impact on these people that we represent and on the communities they live in. If this joint venture is permitted to go forward, we will have witnessed once again a loss of thousands of American jobs and the export of the technology that supports these jobs. The skilled jobs which are at the core of the aerospace industry, such as tooling, planning, engineering and development, will be Taiwanese jobs, not American jobs.

Long Beach and California, as a whole, will be one step closer to experiencing the devastating economic decline that has been experienced by other parts of the country, which has witnessed the export of the auto, steel, rubber and other industries over the past several decades.

In June 1991, local union president Richard Rios wrote to McDonnell Douglas's president, Robert Hood, asking for a joint task force to look into ways and means of maintaining jobs in Long Beach. That letter remains unanswered to this day.

The union remains more than willing to work to maintain jobs in Long Beach, in California, and in the United States. The company does not seem to be concerned with even looking at ways of making their American operation more efficient. They apparently believe that the best return for their investment dollar is to sell American jobs to another country.

We, as aerospace workers, have watched for ten years as a European-subsidized company, Airbus, has gobbled up a huge chunk of market share. Our government has continued to take the position that a hands-off, laissez-faire approach is the best approach. Rather than being the best approach, it is an approach which will result in this country losing not just a part, but probably all of this technology and these jobs.

How long can Boeing continue to compete against government-subsidized companies? Not long.

I just flew in here last night from California on an American-made airplane. Today, Americans who fly, fly in American-made planes. The same cannot be said for Americans who drive. Thirty years ago, Americans primarily drove American-built cars. In the next few years, will they be flying American-built planes?

We stand at a crossroads. We urge that Congress seize this opportunity to save American jobs and American technology. This joint venture should not be permitted to go forward. Hearings should be held in Long Beach, California and in other affected communities to assess the immediate impact of this joint venture.

We ask that President Bush and Congress act aggressively to save our jobs and find an American answer to building commercial airplanes at McDonnell Douglas. And we are willing to help.

I also have a letter here from District Lodge #50 of the International Association of Machinists and Aerospace Workers—the IAM. I would like it added to our statement.

Dated September 2, 1991, to Richard Rios, President, UAW Local #148.

> Dear Brother Rios: We welcome and support your attendance on behalf of the American workers before the Joint Senate Committee on Economic Development on December 3. We have nearly 2,000 machinist union members who have built the fuselage of the MD-11 airplane at General Dynamics, Convair, here in San Diego, California.
>
> We are very much opposed to the joint Taiwan-McDonnell Douglas venture to build future aircraft overseas. At this time, when hundreds of thousands of American workers are not working and skilled jobs are

vanishing daily in this country, we must do everything possible to keep jobs here in America.

Aircraft built in the USA by American workers remain one of the few products which we are known for worldwide. We must retain this technology and manufacturing base here in the USA.

Please express to the Senate Committee members our feeling on this matter on behalf of the 10,000 machinist union members who belong to District #50, International Association of Machinists and Aerospace Workers, AFL-CIO.

Fraternally yours, C.J. Mauldin, President and Directing Business Representative.

Thank you.

[The prepared statement of Mr. Plunkett, together with attachments, follows:]

PREPARED STATEMENT OF GLENN PLUNKETT

My name is Glenn Plunkett and I am Administrative Assistant to Richard Rios, President of Local 148 of the United Aerospace Workers, the UAW. To begin with, I would like to thank Senator Bingaman and the other members of this Subcommittee for permitting us to speak here today and for showing an interest in this matter. I am here on behalf of President Rios and Local 148 and on behalf of the 20,000 employees of Douglas Aircraft Company represented by Local 148 in Long Beach, California. There are currently approximately 50,000 employees of Douglas in Long Beach, a facility that has been in existence since before World War II. The mem and women of our Union are among the highest skilled workers in America.

Long Beach is not the only Douglas facility in this country. Douglas also maintains facilities at Torrance and Huntington Beach, California, Tulsa, Oklahoma, Melbourne, Arkansas and Columbus, Ohio. If this joint venture is permitted to go forward, over a short period of time most of the jobs at these locations will be lost.

For the city of Long Beach, as well as most of these communities, loss of these jobs will be devastating. The loss of employment will expand to employees of suppliers of Douglas, as well as the businesses which are supported by the tens of thousands of employees who are employed by Douglas and who live and work in the community.

Among the major companies which will be seriously jeopardized by loss of these jobs is General Dynamics, which at its San Diego Convair facility performs work on Douglas airplanes which will be almost completely lost as an immediate result of this joint venture.

We are best qualified to speak about this direct and immediate impact on these people that we represent, and on the communities they live in. If this joint venture is permitted to go forward, we will have witnessed once again a loss of thousands of American jobs and the export of the technology that supports these jobs. The skilled jobs which are at the core of the aerospace industry, such as tooling, planning, engineering and development, will be Taiwanese jobs not American jobs. Long Beach, and California as a whole, will be one step closer to experiencing the devastating economic decline which has been experienced by other parts of the country which have witnessed the export of the auto, steel, rubber and other industries over the past several decades.

In June, 1991 Local Union President, Richard Rios, wrote to McDonnell Douglas President, Robert Hood, asking for a joint task force to look into ways and means of maintaining jobs in Long Beach. That letter remains unanswered to this day. The Union remains more than willing to work to maintain jobs in Long Beach, in California, and in the United States. The Company does not seem to be concerned with even looking at ways of making their American operation more efficient. They apparently believe that the best return for their investment dollar is to sell American jobs to another country.

We, as aerospace workers, have watched for ten years as a European subsidized company, Airbus, has gobbled up a huge chunk of market share. Our government has continued to take the position that a hands off, laissez faire approach, is the best approach. Rather than being the best approach, it is an approach which will result in this country losing not a part, but probably all of this technology and these jobs. How long can Boeing continue to compete against government subsidized companies? Not long.

I just flew here last night from California on an American made airplane. Today, Americans who fly, fly in American made planes. The same cannot be said for Americans who drive. Thirty years ago Americans primarily drove American built cars. In the next few years, will they be flying American built planes?

We stand at a crossroads. We urge that Congress seize this opportunity to save American jobs and save American technology. This joint venture should not be permitted to go forward. Hearings should be held in Long Beach, California, and other affected communities to assess the immediate impact of this joint venture. And we ask that President Bush and Congress act aggressively to save our jobs and find an American answer to building commercial planes at McDonnell Douglas. And we are willing to help.

Silvergate District Lodge 50

INTERNATIONAL ASSOCIATION of MACHINISTS
and AEROSPACE WORKERS

MACHINISTS HALL 5150 KEARNY MESA ROAD SAN DIEGO, CALIFORNIA 92111 TELEPHON 292-51

389 685 726 755 LOCAL LODGES 1125 1960 2218

December 2, 1991

Mr. Richard Rios
President
UAW Local 148
3971 Pixie Avenue
Lakewood, CA 90712

SUBJECT: Joint Senate Committee on
Economic Development Hearing - December 3, 1991

Dear Brother Rios:

We welcome and support your attendance in behalf of American workers before the Joint Senate Committee on Economic Development on December 3. We have nearly 2,000 Machinists Union members who build the fuselage of the MD-11 airplane at General Dynamics, Convair, here in San Diego, California. We are very much opposed to the joint Taiwan-McDonnell Douglas venture to build future aircraft overseas.

At this time when hundreds of thousands of American workers are not working and skilled jobs are vanishing daily in this country, we must do everything possible to keep jobs here in America. Aircraft built in the USA by American workers remains one of the few products which we are known for worldwide. We must retain this technology and manufacturing base here in the USA.

Please express to the Senate Committee members our feelings on this matter in behalf of the 10,000 Machinists Union members who belong to District 50, International Association of Machinists and Aerospace Workers, AFL-CIO.

Fraternally yours,

C. J. Maudlin, President and
Directing Business Representative

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UNITED AUTOMOBILE • AEROSPACE • AGRICULTURAL IMPLEMENT WORKERS of AMERICA — RICHARD RIOS, PRESIDENT

UAW INTERNATIONAL UNION

AMALGAMATED UAW LOCAL 148
Representing Long Beach Unit Douglas Aircraft Co. Employees

3871 PIXIE AVENUE
LAKEWOOD, CALIFORNIA 90712
(213) 420-1481 • 1-800-432-2148 • FAX (213) 429-6828

June 4, 1991

Robert Hood, President
McDonnell Douglas Corporation
3855 Lakewood Boulevard
Long Beach, CA 90846

Dear Mr. Hood:

I believe I have given a clear indication of my personal, as well as Local 148's concern about the movement of aircraft production from the Long Beach plant. The problems that you listed with Governor Wilson are the problems of the members of Local 148 as well. I realize that any loss of work from this area will have a tremendous impact, not only upon our members, but also on all the other employees of the Douglas Company. I feel that we, as well as others, should be doing more, politically and publicly, to make everyone aware of the situation as it effects Douglas and its ability to build airplanes in Long Beach.

With that in mind, I would like to propose that Task Forces be formed by Douglas, the Unions and bonifide public and private groups for the purpose of developing the ways and means to alleviate some of the over burdensome detriments to continuing to produce airplanes in Long Beach. If elected representatives would choose to join in, I personally would not be opposed to their participation. The intent would be that the separate Task Forces join together, forming a Joint Task Force. The charter would be to seek political and public support for our mutual benefit.

The sole duties of the Task Force shall be the preservation of the work at Long Beach and there would be absolutely no connection between the Task Force and other Company/Union business, such as grievances and/or negotiations.

If you agree that this could be a worthwhile effort to become mutually engaged in, please contact me at your earliest convenience and we can begin immediately to form these groups.

Sincerely,

Richard Rios

Richard Rios, President
UAW Local 148

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MEMORANDUM

December 2, 1991

TO: DAC Employees

As you know, a year ago DAC initiated a concerted cost reduction program. Actions included deferring capital equipment purchases, reducing expense budgets, tightening inventory controls to generate cash, and reducing personnel.

We've made significant progress and are moving in a positive direction. However, our financial performance compared to Boeing and Airbus is still poor and leaves us with a competitive disadvantage. This means it's critical we continue our cost control efforts -- unfortunately, including layoffs -- as we further reduce aircraft unit costs, span times and overhead expenses.

Further, the airline industry has cyclical ups and downs; we are currently experiencing one of those down cycles, and will be reducing MD-80 production rates from 140 aircraft this year to 100 in 1992. Also, to improve our predictability and increase performance on the MD-11, we plan to produce at a 40 aircraft per year rate from 1992 until 1994.

Layoff notices have been sent to approximately 2,200 employees. Overall, we expect a reduction in force of an additional 1,800 to 2,800 jobs over the next 18 months, from both commercial and government programs, through layoffs and normal attrition.

Human Resources will continue to assist employees who receive layoff notices. Personnel will be available to provide counseling and answer questions about benefits, career counseling, and job training. Whenever possible, we will assist employees in securing new employment using the services of local private and public agencies.

Actions like this are never easy. Our vision is still to become the highest quality, lowest cost, producer of transport aircraft. As we achieve that goal, our future -- and our jobs -- will become more secure.

R. H. Hood, Jr.
President

SENATOR BINGAMAN. Thank you very much. Let me ask a few questions here.

Mr. Prestowitz, let me ask you, first of all, Airbus seems to be a major cause of the difficulties that McDonnell Douglas is encountering. You went over this briefly in your opening statement, but maybe you could elaborate a little bit on what you think we should have done to deal with Airbus up until now, and what is still available for us to do, whether this particular sale by McDonnell Douglas goes through or not.

MR. PRESTOWITZ. Well, the Airbus has probably been the leading industrial policy project of the European community over the past 25 years. And it has been subsidized directly and indirectly. Directly with grants from the governments to the tune of twenty-plus billion dollars, indirectly by the fact that the Airbus knows that when it produces airplanes that it's going to have a certain assured market among the European airlines, many of which are state-owned or state-controlled.

Beyond that, it knows that when it sells in Singapore, or India, or other places that it's going to have the full force of the European governments behind it, even to the extent of making concessions on air and landing rights and other diplomatic concessions in order to achieve Airbus sales.

As opposed to that, the United States———

SENATOR BINGAMAN. Let me just ask on that one issue, is it accurate, as you understand it, when Airbus recently got an order from Singapore Airlines, part of the deal was that they would provide landing rights at French airports?

MR. PRESTOWITZ. That's my understanding, yes, sir.

SENATOR BINGAMAN. All right.

MR. PRESTOWITZ. As opposed to that, our own government has taken a very hands-off approach, and I can best describe it to you by giving you a concrete example.

In the fall of 1985, you may recall that the U.S. trade deficit was soaring to $160 billion. Some of you in the Congress were attempting to do something about it. Your attempts were worrying the White House, and the President gave a speech.

In his speech, he said that he had created a strike force which was going to seek out unfair trade wherever it might be and smite it down.

Not one single American worker, said the President, would lose his job because of the unfair trading activities of our trading partners.

Now, when I saw that speech, I chuckled and turned to my wife. I said, "You know, this is really funny. There are 240 million Americans out there who think that the President with all the power and resources of Washington at his fingertips has carefully analyzed this problem and has come up with this strike force solution. Nobody knows there is no strike force."

The next day I went to my office, and Secretary Baldrige called me into his office and asked me if I'd heard the President's speech. I said, yes. He said, we need a strike force.

It was totally hokey. It was Peggy Noonan trying to make the President sound tough. But the interesting thing is, if a President says on national TV that he has a strike force, he has to have one. And what's more important, it has to strike at least once.

So, the issue in the fall of 1985 became, what would we strike? And there was the Airbus. The Airbus situation is outside the rules of U.S. trade law. It's outside the rules of the international trade law. Every Airbus that's sold in the United States is being sold here below cost. It's being sold here below the price at which it's being sold in the home market. That's dumping. The countervailing duty laws, the dumping laws are applicable.

A proposal was made at that time to the Cabinet that the trade laws of the United States should be enforced or, at least, if not enforced, that the United States should lodge a formal GATT complaint and begin a formal procedure which would lead eventually either to the cessation of the subsidies or to the imposition of countervailing duties on planes being sold in the United States.

I remember the meeting at which that was discussed.

Then Secretary of State Shultz, who rarely attended meetings of the Economic Policy Council, attended that one. He said, absolutely, no way could we do that. If we attempted such a maneuver, NATO would collapse. Our allies the French and Germans would turn their backs on us. We couldn't possibly do anything nasty over trade because of the danger of NATO collapsing.

But there it is, Mr. Chairman. The fact is that we have trade laws. A large number of these airplanes are being sold in the United States, essentially in contravention to U.S. trade law.

All that is needed is for the President to enforce the law, and countervailing duties can be imposed.

Beyond that, let's look at places like Singapore. The Singaporese get extra landing rights if they'll buy Airbuses.

Recently, the Singaporese have been at pains to make it known that they do not wish the American 7th Fleet to abandon the Western Pacific. It boggles the mind to think that the leverage of the United States in these international deals is not at least equal to that of other trading nations.

We have an Export/Import Bank. The bank is underfunded at the moment. But there's no reason why a war chest couldn't be put together. In fact, it's really hard to understand, for example, in the case of subsidies of grain and agricultural products, the U.S. government has made the demand that the Europeans stop subsidizing their agricultural products, an upset issue. This is the issue which will sink the GATT Uraguay Round negotiations..

The U.S. government has stood fast on the demand that those be stopped. And, indeed, the U.S. government put together a war chest to offset the export subsidies of the Europeans in foreign agricultural markets.

Why that can't be done in the case of aircraft escapes me.

SENATOR BINGAMAN. Let me ask a question on a related issue. You referred to the U.S. ability to have leverage or influence over other governments.

Am I right that Kuwait's recent decision was to buy Airbus, as well?

MR. PRESTOWITZ. I'm not sure. That's a new one to me. But it wouldn't surprise me.

SENATOR BINGAMAN. Let me ask Mr. Goodreau if he would comment on the issue of integration of defense and nondefense technologies and manufacturing.

One of the things which has concerned me and, I think, some in Congress is, as the defense budget goes down more and more, we need an integration of our defense and nondefense sectors in order to remain capable, in order to maintain our industrial capacity.

I know that McDonnell Douglas takes the position that they can keep their commercial aircraft business separate from their defense-related aircraft business and that that would not be a concern in this transaction.

But at the subtier level, at the subcontractor level, which you're operating at, is there a distinction made? Are you in the business of doing defense work or commercial work? And if so, how do you separate it out? Is it realistic for us to think that we can lose our subcontractors on the commercial side and keep them in the defense arena?

MR. GOODREAU. I'd like to say that commercial aerospace and defense are really intertwined, because if you're going to work to one quality system, you're going to work to the other, and because it's all covered under MIL-I-45208A, which is the quality program that the government makes us adhere to. It's in all of the aerospace prime contractors' terms and conditions, or their own quality terms and conditions.

When it comes to just commercial applications, if I was to make parts for refrigerators—things like that—there's no way that I can be competitive in that area.

Where the European policy comes in, the ISO-9000 spec, which is their quality spec, it starts to merge commercial and military systems together, because the only way you can get competitive is to get rid of fat and inefficiencies. You have to work to a quality standard that is promoting products which come off the manufacturing line error free. Reference a new Chrysler ad, where they designed and manufactured their new car in 3 years.

The way that's done is by perfect communication and cooperation between all areas of manufacturing, from engineering to the person that drives the car off the factory floor.

So, in order to be competitive in the defense and aerospace industries, we need to improve our quality to such a point that it lowers our costs.

SENATOR BINGAMAN. The line, as you see it, is that your firm, and firms similar to yours, are probably not going to be competitive in the commercial arena unless some significant improvements are made in the way you do business. Is that what you're saying?

MR. GOODREAU. Yes. The commercial side of it being not aerospace. Aerospace and defense are, as far as I'm concerned, if it flies, it doesn't matter whether there's a military pilot flying in it or my wife and my kids. It's all the same thing. It has the same importance, and at this point in time, it's all governed by the same quality systems.

SENATOR BINGAMAN. OK. I have one other question for either Mr. Goodreau, or Mr. Plunkett, or Mr. Prestowitz.

A concern I have is that it appears that what we are concluding—we as a country, U.S. industry—that manufacturing can be done better and more cheaply overseas. And therefore we will not try to deal with the enormous problems of upgrading manufacturing in our own country but, instead, will go ahead and source it offshore.

Is that a valid concern? There's a statement that led me to this in the November 15, *Wall Street Journal*, where a McDonnell Douglas executive was quoted as saying, "We're looking out and saying that we see sources that can do things better and cheaper than we can do them ourselves."

Is that a statement just about McDonnell Douglas's inability to do things better and cheaper, or a statement about the ability of our manufacturing sector?

MR. PRESTOWITZ. I don't think it's either, Mr. Chairman. I want to emphasize that nothing that I say should be construed as criticism of McDonnell Douglas, which I think is in a difficult position. But I believe that that kind of a statement is in fact part of the political drama or theater that is going to go on around this.

McDonnell Douglas, finding itself in difficult circumstances, feels that this deal is its salvation. Now, the salvation to McDonnell Douglas is not that somehow Taiwanese workers, who have never built this kind of an airplane before, can do it better and cheaper. That's not the real salvation for McDonnell Douglas.

The salvation for them is that they need a capital infusion, and they can get a quick one from Taiwan. And second, the Taiwanese government and other Asian governments, like the European governments, are dedicated to being in the aircraft business.

So, in effect, Douglas will receive a government subsidy, too. It won't be an American subsidy. It will be an Asian government subsidy. Boeing is currently receiving indirectly a Japanese government subsidy, and, of course, the European Airbus is getting European government subsidies.

So, what Douglas really is looking for is a government subsidy, and that's what this deal is. But it has to be justified. Douglas really can't justify this deal by coming before the public and saying to the public that, gee, we need a government subsidy, and we're going to go to Asia to get it. And so the deal has to be sold. And the way to sell it is to say, hey, those Asians, they're fantastic manufacturers. And the public mind is conditioned to the notion that the Asians are really low-cost manufacturers. People don't stop to think that manufacturing television sets and airplanes is a different game and that the Asians are probably not the low-cost manufacturers in aircraft.

So, the story is made for PR purposes that this can be done cheaper and better overseas, and in the tradition of American capitalism, that is thought to justify the deal.

SENATOR BINGAMAN. Mr. Goodreau?

MR. GOODREAU. Senator, I take exception to the word "better." They can certainly do it cheaper. What we've done in many industries is we've taken a situation just like this and allowed many products to be purchased from foreign firms because of cheap prices. Over the long run, as they learn, just like we learned, the product begins to get better and better and better. And I've seen that happen with Japanese machine tools and with cars.

I mean, the Honda was the butt of everybody's joke. But at this point in time, their quality is desirable. Most Americans prefer to buy a Japanese-made car.

SENATOR BINGAMAN. Mr. Plunkett, did you have a comment on any of this?

MR. PLUNKETT. Yes. In your first question about whether or not they're just looking for cheaper labor or a cheaper way out, that's the way the working man looks at it. That is indeed the way they look at it.

Taking, for example, your fast-track, fair trade agreement with Mexico and the auto sector. They're very nervous about that, about companies just up and leaving communities to go for the 95-cent-an-hour job that's paid in Mexico.

Along with these two gentlemen, I agree that right now they don't have the technology or the skill to do the type of tooling and planning work that's required to develop an airplane. However, with our know-how and technology—you go in there to show them how to do it—it's only a matter of years before they're equal to, if not surpassing, us.

SENATOR BINGAMAN. Let me just ask one more clarifying point.

Mr. Prestowitz, I think you said that Boeing is receiving about a one-billion-dollar indirect subsidy from Japan. Could you elaborate on that and on how the figure of a billion dollars was arrived at?

MR. PRESTOWITZ. Well, Boeing is doing various projects in conjunction with a Japanese consortium, which includes Mitsubishi Heavy Industries, Kawasaki, Fuji Heavy Industries and so forth.

That Japanese consortium is part of an ongoing Japanese government industrial policy effort to develop and enhance aircraft capability in Japan. And that program has been subsidized continuously over the years by the Japanese government. The billion-dollar figure may actually be low. It may actually be two billion dollars. But that is roughly the figure that has been mentioned as MITI's contribution to the Japanese consortium working on development of the 777.

In effect, what is happening is this. Again, this is not meant as a criticism of the U.S. aircraft companies, because I empathize with their situation. But effectively, what's happening is that you have a Boeing or McDonnell Douglas in the market, and they are immediately up against the Airbus. The Airbus is eating up market shares. It is being subsidized.

And our companies not only are losing market share, but they face the necessity to develop a new generation of aircraft, which effectively is a company decision.

At that moment, the Japanese, or the Taiwanese, or the Koreans, or whoever it is who also have industrial policies aimed at developing their aircraft capability, approach the American company, and they say, gee, it's really a tough problem you have there with the Airbus. How would you like some help?

And they may even say, and golly, you'd probably like our airlines to keep on buying your airplanes, wouldn't you? And the American company is in a situation where they say, well, yes. You know, it might be nice to have an extra billion dollars. And it certainly would be nice if your airlines would keep buying our airplanes.

And so what's the quid pro quo? The quid pro quo is that you have to teach us how to build airplanes via subcontracting, codevelopment, joint venture deals.

Now, at that point, the Americans who are caught between the devil of the present—the Airbus—and the devil of the future—the consortium—tend to go with the devil of the future, telling themselves and the public that they will somehow protect the technology, that they will only transfer old, obsolete technology while keeping the visiting engineers in isolation chambers so that they can't learn anything through the joint venture.

And the difficulty I see in this is that, as I've said, we've had enough experience in other industries to know that it's not so easy to protect and to somehow make divisions between what transfers and what doesn't.

So, while I sympathize with the problems of the U.S. aircraft companies, it seems to me that they are in a no-win situation, and this is a situation in which what is maybe good for the companies immediately is not necessarily what's good for the United States. Or to put it another way, the long-term result of this kind of solution is the inevitable emigration of another important U.S. industry.

The only entity that has the power to stop that is the U.S. government.

SENATOR BINGAMAN. Well, thank you very much. I think we'll go ahead and go to the next panel. We do have two additional panels. I appreciate your testimony very much.

Why don't we have Carol Evans, Edward John Ray. Is Mr. Modzelewsk here from Paine Webber?

[No response.]

And Professor Mowery is not here yet, either, as I understand it. Is that right?

[No response.]

We have the ironic situation of having a hearing on the aircraft industry where various of our airplanes haven't been able to land out at National Airport. So, I do think we have a couple of witnesses who have

not been able to get here as yet. I hope they'll be able to arrive before we conclude the hearing.

Carol Evans is an assistant professor in the Lanegger program in international business diplomacy at Georgetown University School of Foreign Service.

Edward John Ray is professor in the Department of Economics at Ohio State University and currently is chair of that department.

We appreciate both of you being here. Ms. Evans, why don't you go right ahead, and we'll hear from you first and then from Mr. Ray.

STATEMENT OF CAROL V. EVANS, PROFESSOR, LANDEGGER PROGRAM IN INTERNATIONAL BUSINESS DIPLOMACY, SCHOOL OF FOREIGN SERVICE, GEORGETOWN UNIVERSITY

Ms. EVANS. Thank you for the opportunity to appear before this Committee today.

I'd like to thank you for letting me appear here today. I will try to keep my comments as brief as possible. And since I was contacted relatively at the last moment, today, I have submitted a written statement for your consideration.

I would like to describe the basis of my testimony; namely, it is based on research derived from two important sources. The first is a research project that began two years ago when I conducted a massive survey of St. Louis-based military contractors, both at the prime and subtier levels.

What I was interested in, and this was before the end of the cold war, was exactly what was going to be the economic impact to the St. Louis region of reductions in U.S. defense spending. So, I have a survey of over 200 prime and subtier dual commercial defense contractors, including McDonnell Douglas and many of its suppliers.

The second source for my comments today derives from a very important recent study conducted by the Office of Technology Assessment entitled "The Global Arms Trade" that you and other members of the Senate Armed Services Committee requested last year, in fact.

What I would like to do is to briefly describe what I perceive to be the globalization and structure of the U.S. aerospace industry.

I think it is very important to start there because I do not think that we can view the McDonnell Douglas-Taiwanese venture in the narrow domestic context. We certainly need to view it in the larger structure of the U.S. commercial aerospace market and various trends affecting what I consider to be declining technology, as well as financial indicators of that market, as well as the accelerated globalization of the worldwide aerospace industry.

Briefly, let me describe some of the trends that I foresee in the U.S. aerospace industry.

Although we've seen relatively high levels of exports, I think such optimism masks some very disturbing downward trends. Profits, as a percentage of sales in this industry, has been declining, as well as the

industry's debt-to-equity ratios. For McDonnell Douglas, the company's estimated $2.7 billion aerospace debt has indeed led to its current financial crisis and particularly to its depressed stock, as well as, then, increased costs of capital for the firm.

Another downward trend is obviously aerospace employment, which has declined by 9 percent over the past year, and I think it is a trend that is likely to continue, given the massive reductions that we're seeing in the military aerospace sector.

In addition, we're seeing declines in investment in plants and equipment, perhaps, the most sigificant drop of all, from $1.5 billion roughly in the first quarter of 1990 to about $670 million in the first quarter of 1991.

R&D is similarly declining.

What I would suggest, then, is that these economic indicators could indicate declining financial and technological capabilities and could ultimately decrease the competitiveness of the U.S. aerospace industry.

Firms like McDonnell Douglas, whose survival to date has really rested on the success of its military aerospace market as opposed to its commercial sales, is extraordinarily vulnerable to continued reductions in military spending.

Indeed, 60 percent of McDonnell Douglas's total sales are due to the military as opposed to its rival, Boeing, which only relies on about 20 percent of military sales.

So, ironically, the U.S. military procurement system has made it possible for McDonnell Douglas to continue to subsidize its commercial operations from profits derived from military sales. So, prime contractors like McDonnell Douglas must literally bet the future of the company in an attempt to secure financial military contracts.

The situation is obviously being exacerbated by the cancellation of the A-12 contract and McDonnell Douglas's loss of the bid for the development of the ATF.

A second consideration is obviously the continued globalization of the aerospace industry, both the military and commercial sectors. This industry is increasingly characterized by international collaboration agreements, including licensing, joint ventures, codevelopment production, as well as offsets. And obviously such forms of international collaboration are not only being affected by conditions internal to the U.S. aerospace market, but they are driven internationally by three important needs.

The first is to spread technological risks and reduce the costs involved in R&D and new product development, as well as in manufacturing.

The second is to secure access to capital and technology of partners. Clearly, this is a very nice partnership between the Taiwanese and McDonnell Douglas in this respect.

The third reason for international collaboration is obviously to secure market access and reputational benefits. Again, the Pacific Rim is a very important market for all U.S. aerospace industries, a factor that I will turn to later.

Given these structural difficulties of the shrinking U.S. domestic commercial market, as well as the process of globalization, obviously, such teaming arrangements, as the various panelists have already spoken about today, are necessary.

In fact, I would argue that McDonnell Douglas has been all too slow to recognize its need to participate in the global market.

According to the OTA study, the ironic situation of such international collaboration agreements by U.S. companies has already led to massive transfers of military and dual-use technologies. And in the Western Pacific, they have already contributed to the substantial development of the aerospace industries of South Korea, Japan, Singapore, Indonesia and Taiwan.

Today, the Pacific Rim represents the largest and fastest growing market in the world. In fact, we have a number of U.S. subtier firms that are already involved in those U.S. aerospace industries. For example, General Dynamics, Cincinnati Milacron, Sundstrand Pacific, General Electric, amongst a huge list of others, are either involved through offsets, licensing and, in some instances, through direct foreign investment.

What is new about this process of globalization, however, is that there has been very little direct foreign investment by the Pacific Rim in the U.S. commercial aerospace industries. We have seen some evidence of Singapore, for example, investing in aircraft maintenance facilities in this country. They have a facility in Mobile, Alabama.

Still, such foreign investments are minimal compared to the 40 percent equity participation of Taiwan. And while some would view this as a one-off agreement, I would argue that such direct foreign investment in the U.S. defense industrial base is likely to continue.

What, then, is the impact of these two trends and in the context of the McDonnell Douglas-Taiwanese partnership on the U.S. defense industrial base?

I think that there are three important issues that perhaps should be addressed. The first is the accelerated transfer of commercial technologies to future competitors. We have touched on it already today.

The second is the potential leakage or transfer of sensitive defense technologies.

And the third is the likely substitution of U.S. subtier firms by Taiwanese companies.

Let me start briefly with the first. I think that there is no doubt that the McDonnell-Taiwanese agreement will result in a substantial amount of technology transfer to the Taiwanese. The Taiwanese have targeted the aerospace market, both in terms of military and commercial, by strengthening linkages between the private industry, its capital goods firms, as well as its government-owned aerospace industry.

Indeed, Taiwan has two important scientific institutions, one being the industrial technology research institute, which, in fact, looks at developments in R&D technologies and transfers them to private industry, as well as the Hsinchu Industrial Park, in which, again, a number of aerospace-

related technologies and firms involved in that sector have an incubator program.

The fact that Taiwan has developed the indigenous defense fighter, I think, significantly indicates the ability of this country to absorb and develop aerospace-related technologies, and not in the long term. I think that it is something that is already very much underway.

Indeed, Taiwan's indigenous defense fighter program has already been helped by U.S. companies, such as General Dynamics, General Electric and Lear Astronautics.

The issue related to this is whether the United States is, in fact, transferring a very significant amount of aerospace technology at the taxpayer's expense.

What I would argue is that commercial aerospace production technologies, aside from design technologies, are easily antiquated by comparison to what is in the military market. Moreover, these commercial technologies are already on the global market.

U.S. taxpayers have indeed paid for the development of many important aerospace technologies, but in the military sector, not in the commercial sector. And I think that we need to separate the two.

Furthermore, McDonnell Douglas as a dual company, both as the provider of military as well as commercial aircraft, has been restricted by U.S. law from transferring technologies developed and paid for by the Defense Department to the commercial sides of its business.

Finally, I would probably argue that such a transaction as the Taiwanese equity agreement does not pose a threat to McDonnell Douglas's traditional technology strengths, such as systems design, integration and aerodynamics, areas in which there are no patents or easy means of licensing.

Let me now turn to the issue of transfer, or the potential transfer, of military technologies to the Taiwanese.

Again, I think it's important to keep in mind the huge divergence between mature commercial aerospace production, which is based on safety and conservatism, and those that are state-of-the-art military technologies, based on high performance criteria.

Indeed, this divergence between military and commercial is very much instituted within the corporate structure of McDonnell Douglas itself, in part because of its corporate identity, as well as because of Defense Department procedures and regulations.

So, I tend to view the ability for McDonnell Douglas to safeguard such technology leakage to the Taiwanese or any of its minor Asian investors as very strong.

I think the most important issue is the likely impact of the proposed McDonnell Douglas sale of its commercial operations to the U.S. aerospace subtiers. I think this is a very critical issue.

In the long term, the transfer of major assembly production like the MD-12 and other aircraft to Taiwan will inflict a serious effect on U.S.

subtier firms, particularly for manufacturers of machinery, and other panelists have already suggested that today.

In the short term, however, I would argue that the sale may enable some U.S. aerospace suppliers to remain in business and potentially increase their exports to the Pacific Rim, even while Taiwan develops a capable and reliable subtier network.

At present, it is also important to keep in mind that there is a U.S. defense industrial base at the subtier level that has been doubly hit by decreases in military and commercial sales.

In fact, my survey of the St. Louis-based subtier firms revealed that these important dual technology firms are having to adjust to such declines through two strategies.

The first strategy that they have been interested in is expanding their domestic commercial markets.

The second strategy that they have emphasized is the necessity and need to export abroad.

Indeed, when I asked them what kinds of federal, state or local business assistance programs would be useful in meeting these two adjustment strategies, the subtier supplier firms have uniformly emphasized the need for research and development assistance, marketing information, and export and financing assistance, more than is currently being provided by the Commerce Department.

The generally favorable disposition toward a defense industrial policy by these firms is characterized by a response to my survey. This was provided by a specialized equipment supplier to McDonnell Douglas, and I think it is worth citing in full.

> If we are going to be contender in the global market place, much less a winner, it is time for the government to turn its energies and our tax dollars into the creativity and productivity of U.S. companies, large and small.
>
> As a sales manager for one of the Asian Rim companies told us, these fellows buy one of our products, do an intensive value analysis of it, rebuild it, and put it back on the street with their name, and it has a much higher quality and is more competitively priced than the one they bought.

What then are the implications for U.S. public policy?

Let me briefly outline four areas of consideration. The first is the majority of the subtier firms that I surveyed have all called for some form of a defense industrial policy through the establishment of a commercial equivalent to DARPA. Many of these firms have argued that the Commerce Department's advanced technology program is inadequate or too narrowly focused. It has limited funding.

In a global market now characterized by cross-border alliances, some form of indirect R&D support is needed to provide firms working in these strategic technology areas against the risk of innovation.

The second issue is, in an effort to bolster domestic commercial aerospace markets, we will have to take into effect the continued restructuring of the U.S. defense aerospace industry. The cancellation of the A-12 military contract and the loss of the ATF led McDonnell

Douglas to lay off over 40,000 highly skilled aerospace designers and production workers, as well as managers. Many of these people in the St. Louis area still have yet to find work.

As you know, it is only after the company's request for financial assistance from the Defense Department and the Executive Branch was refused—McDonnell Douglas apparently has secured much needed capital from Taiwanese investors—that the government concern has now been kindled.

If the U.S. wishes to retain dual commercial, defense-based markets, it will need to address the related issues of how many companies are needed in the defense aerospace business, how to retain design teams, research and development capabilities, and the supplier base.

All of these issues involve a review of U.S. weapons procurement policies.

The third issue is that the United States now faces the specter that commercial U.S. aerospace firms must seek foreign rather than domestic partners. I think that this is a very important trend, and I think it's something that we need to consider.

If this emerging pattern is to be averted, this Committee may want to examine current antitrust legislation that at times, I think, has unwisely restrained the ability of U.S. firms to reduce the risk of innovation and commercialization of new technologies through collaboration. We see it with our European and Japanese partners. American firms are prevented from such alliances.

While Congress has responded in a limited way, through the passage of the 1984 National Cooperative Research Act, I think further action may be necessitated to facilitate the coordinated efforts among U.S. firms. If permitted, such collaboration inevitably could strengthen the U.S. supplier base as well as tighten relations between the prime and subtier levels.

And, finally, the Pacific Rim market is clearly of vital importance for the competitiveness of U.S. aerospace producers, both at the prime contractual level, such as McDonnell Douglas, as well as the subtier firms.

In this respect, U.S. trade policy must aim at opening and ensuring continued market access to this region. While some countries, such as Singapore, have been very open and receptive to U.S. direct foreign investment, others in the Pacific Rim have been extraordinarily closed.

At the same time, the issue of foreign government subsidies of their aerospace industries has to be addressed, and we have already briefly discussed this today. But so does, I think, continued U.S. export financing of aerospace products, should the foreign import content increase. This would, in fact, represent a very peculiar situation.

This concludes my testimony today, and many thanks.

[The prepared statement of Ms. Evans follows:]

PREPARED STATEMENT OF CAROL V. EVANS

Introduction and Summary of Testimony

My name is Carol Evans. I am a professor in the Landegger Program in International Business Diplomacy, School of Foreign Service, Georgetown University. The testimony that I am providing for this committee is based largely on two sources. The first is survey research that I conducted in St. Louis related to my study of the U.S. defense industrial base in transition. That study involved an analysis of the potential economic impacts to the St. Louis region of reductions in U.S. defense spending. It is based on a survey of over 200 prime and subtier dual commercial/defense contractors, including McDonnell-Douglas and many of its suppliers. The second source is a recent report by the Office of Technology Assessment, *The Global Arms Trade*, that you and other members of the Senate Armed Services Committee requested last year.

Summary Points

In the time remaining, I would like to address the following four central points:

1) The proposed sale of 40% of McDonnell-Douglas' commercial aerospace operations to Taiwan and a potential 10% share to South Korean, Singaporean, and Indonesian investors must be viewed in light of: a) the high cost structure of the U.S. aerospace industry (relative to government-subsidized consortia such as Europe's Airbus industry); and b) in the context of the

globalization of the aerospace industry through cross-border alliances.

2) The U.S. national security ramifications arising from the proposed sale are mixed. On the positive side, the potential for transfer of defense-related aerospace technologies to Taiwan can be safeguarded. Additionally, transfers of commercial aerospace technology do not threaten McDonnell-Douglas' technological lead or competitiveness in the areas of systems design and integration. On the negative side, in the next decade McDonnell-Douglas' subtier firms are increasingly likely to be replaced by Taiwanese manufacturers. However, such shifts toward overseas manufacture are already underway through various offset arrangements with such countries as Brazil, Singapore, Indonesia, and South Korea. Indeed, if these U.S. subtier firms reinvest and become significant exporters themselves, the Taiwanese subtiers may very well replace Asian rather than U.S. aerospace manufacturers.

3) To conclude, direct foreign investment, such as that proposed by the McDonnell-Douglas/Taiwanese commercial partnership, in the strategic U.S. aerospace industry is a distinct indicator of the competitive constraints U.S. firms are facing in what is now a truly global industry. In order to meet this challenge, the U.S. Congress and the Executive branch must undertake a coordinated, serious, long-term re-evaluation of U.S. technology, anti-trust and trade policies.

Globalization of the U.S. Aerospace Industry

The first issue that I would like to address today is that the sale by McDonnell-Douglas' of up to forty per cent of its commercial aircraft manufacturing operations to Taiwan Aerospace Corporation should not be viewed simply in isolation. It is part of the broader context of the

structure of the U.S. commercial aerospace market, and the accelerating globalization of the aerospace industry.

Although the U.S. aerospace industry continues to maintain high levels of exports, too much optimism may mask disturbing downward trends. During the first quarter of 1991, profits as a percentage of sales declined from 4.1% to 3%, at the same time the industry debt-to-equity ratio rose from 62% to 67%. For McDonnell-Douglas, the company's estimated $2.7 billion of aerospace debt (out of a total of $4.8 billion debt) has led to depressed stock prices and has drastically increased the cost of capital for the firm.

Employment in the aerospace industry also declined over the past year by nine percent, a trend that will likely be reinforced given the ongoing reductions in the military aerospace sector. Investment in new plant and equipment significantly dropped from 1.15 billion in the first quarter of 1990 to 670 million in the first quarter of 1991. Research and development spending in aerospace has declined by two per cent this year, following a decline in 1990 of three percent.

These economic indicators may suggest declining financial and technological capabilities, and ultimately decreased competitiveness of the U.S. aerospace industry. Firms like McDonnell-Douglas, whose survival has rested on its military aerospace market as opposed to its commercial sales may be particularly vulnerable. Indeed, sixty per cent of McDonnell-Douglas' total sales are military, as opposed to its rival, Boeing with only 20 per cent. Ironically, the U.S. military procurement system has made it possible for MD to continue to subsidize its commercial operations from profits derived from its military sales. Prime contractors like McDonnell-Douglas must literally bet the future of the company in an attempt to secure future military contracts. This situation has been exacerbated by the cancellation of the A-12 contract

and McDonnell-Douglas' loss of the bid for development of the ATF.

I hope this committee will examine the proposed McDonnell-Douglas/Taiwanese partnership in the context of the continued globalization of the aerospace industry (both military and commercial sectors). The industry is increasingly characterized by international collaboration agreements, including licensing agreements, joint ventures, codevelopment and production as well as offsets. Such forms of international collaboration, especially in the commercial aircraft markets, are being driven by corporate needs to:

1) spread technological risks and reduce the costs involved in R & D, new product development and manufacturing;

2) secure access to capital and technology of partners and;

3) secure market access and reputation benefits.

Together, the underlying structural difficulties of a shrinking U.S. domestic commercial market, as well as the process of globalization have necessitated international teaming arrangements such as Boeing/Mitsubishi and Airbus. McDonnell-Douglas, in fact, has been slow to recognize its need to participate in the global market.

According to the OTA's *Global Arms Trade* study, such international collaboration agreements by U.S. companies have led to massive transfers of military and dual-use technologies and, in the case of the Western Pacific, have contributed to the development of the aerospace industries of South Korea, Japan, Singapore, Indonesia, and Taiwan. Today the Pacific Rim represents the largest and fastest growing aerospace market in the world. U.S. firms, such as General Dynamics, Cincinnati Milacron, Sundstrad Pacific, General Electric, are already involved in these countries' aerospace industries through offsets, licensing and in some cases direct foreign investment.

What is new about this process of globalization, however, is that there has been little direct foreign investment by the Pacific Rim countries in the U.S. commercial aerospace industry. Singapore, for example, through Singapore Aerospace Ltd. (67 per cent government owned through Singapore Technologies Holding) has bought an aircraft maintenance facility in Mobile, Alabama. (Singapore Aerospace also maintains an 87% equity stake in a British company that leases and provides Boeing 737 parts). Still such foreign investments are minimal compared to the 40 per cent equity participation of Taiwan, and while some may view this venture as a "one-off" agreement, I would argue that direct foreign investment in the U.S. defense industrial base is likely to continue.

Impact of the U.S. Defense Industrial Base

Given the poor financial health of many U.S. domestic manufacturers, the high costs of new product development, the existing overcapacity of the international aerospace industry, as well as the need to secure market access in the competitive Pacific Rim market, the Taiwanese purchase of 40 percent of MD is understandable and appealing. However, direct foreign investment by Taiwan of such a strategic defense-industrial company as McDonnell-Douglas raises some legitimate U.S. national security concerns. In relation to the U.S. defense industrial base, three important issues should be addressed: 1) the accelerated transfer of commercial technologies to future competitors; 2) the potential leakage or transfer of sensitive defense technologies; and 3) the impact of the likely substitution of U.S. subtier firms by the Taiwanese.

First, there is no doubt that the MD/Taiwanese agreement will result in a substantial amount of technology transfer to the Taiwanese. The Taiwanese government has targeted the aerospace industry as a strategic sector, providing both capital to its state-owned aerospace

company, as well as strengthening the linkages between this sector and private industry through cooperative research and development (the Industrial Technology Research Institute as well as the Hsinchu Industrial Park). Taiwan's Indigenous Defence Fighter program, which benefitted substantially from assistance provided by General Dynamics, Lear Astronautics, General Electric, among others, demonstrates the country's ability to absorb and develop aerospace-related technologies.

The issue that United States is transferring a tremendous amount of aerospace technology to Taiwan at a fraction of the development costs, and at the taxpayers' expense is confused. Commercial aerospace production technologies, similar to the automotive sector, are mature (or "downright antiquated" as one U.S. aerospace engineer has said), and are already available on the global market. U.S. taxpayers have indeed paid for the development of important aerospace technologies *but in the military not the commercial sector*. Furthermore, McDonnell-Douglas and other companies are restricted by U.S. law from transferring technologies developed for and paid by the Defense Department to the commercial sides of their businesses. Finally, I would argue that such a transaction does not pose a threat to MD's traditional technology strengths -- systems design and integration, aerodynamics, etc -- areas in which there are no patents or easy means of licensing.

Second, as mentioned above there is a huge divergence between mature commercial aerospace production, which is based on safety and conservatism, and state-of-the-art military technologies based on high performance criteria. This divergence between military and commercial technologies is instituted within the corporate structure of MD itself, in part because of Defense Department procedures and regulations. It is highly improbable, given current

safeguards against technology leakage, that the Taiwanese or any of the minor Asian investors could have access.

Third, the issue of the likely impact of the proposed McDonnell-Douglas sale of its commercial operations to U.S. aerospace suppliers is critical. In the long term, the transfer of the major subassembly production for the MD-12 and other aircraft to Taiwan will inflict a deleterious effect on U.S. subtier firms, particularly for manufacturers of machinery. In the short term, however, the sale may enable some U.S. aerospace suppliers to remain in business and potentially increase their exports to the Pacific Rim even while Taiwan develops a capable and reliable subtier network.

At present this important sector of the U.S. defense industrial base has been doubly hit by decreases in military and commercial sales. In fact, my survey of St. Louis regionally-based, subtier firms revealed that these dual technology firms are adjusting to such declines by expanding their domestic commercial markets and by trying to export abroad. When asked what kinds of federal, state or local business assistance programs would be useful in meeting these two adjustment strategies, the subtier firms uniformly emphasized research and marketing information, export and financing assistance, more than is currently being provided by the Commerce Department. The generally favourable disposition toward a defense industrial policy by these aerospace supplier firms is characterized by this response to my survey provided by a specialized equipment supplier to McDonnell-Douglas:

> If we are going to be a contender in the global marketplace, much less a winner, it is time for the government to turn its energies and our tax dollars into the creativity and productivity of U.S. companies large and small. As the Sales Manager for one of the Asian Rim companies told us: "These fellows buy one of

> our products, do an intensive value analysis of it; rebuild it and put it back on the street with their name; and it has a much higher quality and is more competitively priced than the one they bought."

Implications for U.S. Public Policy

In an effort to contribute a discussion of how this committee might stimulate policy measures that better address the competitiveness of the U.S. aerospace sector, let me briefly outline four areas for consideration.

1) The majority of the subtier firms that I surveyed called for some form of a defense industrial policy through the establishment of a commercial equivalent of DARPA. Many of these firms argued that the Commerce Department's Advanced Technology Program was inadequate because of its narrower scope and limited funding. In a global market, characterized by cross-border alliances, some form of indirect R&D support is needed to provide firms working in strategic technology areas against the risks of innovation.

2) Efforts to bolster the domestic commercial aerospace market will have to take into consideration the restructuring of the U.S. defense aerospace industry. The cancellation of the A-12 military contract and the loss of the ATF led McDonnell-Douglas to lay off over 40,000 highly skilled aerospace designers, production workers as well as managers. As you know, it was only after the company's request for financial assistance from the Defense Department and the executive branch was refused and McDonnell-Douglas apparently has secured much needed capital from Taiwanese investors that government concern was kindled. If the U.S. government wishes to retain dual commercial/defense aerospace producers, it will need to address the related issues of how many companies are needed and how to retain design teams, research and

development capabilities and the supplier base -- issues involving a review of U.S. weapons procurement policies.

3) The United States now faces the spectre that U.S. commercial aerospace firms must seek foreign rather than domestic partners. If this emerging pattern is to be averted this committee may want to examine current antitrust legislation that at times unwisely restrains the ability of U.S. firms to reduce the risks of innovation and commercialization of new technologies through collaboration. While Congress has responded in a limited way through the passage in 1984 of the National Cooperative Research Act, further action may be needed to facilitate the coordinated efforts among U.S. firms, who face government subsidized competitors in the global marketplace. If permitted, such collaboration would inevitably strengthen the U.S. supplier base as well as tighten relations between prime contractors and the subtiers.

4) Finally, the Pacific Rim market is of vital importance for the competitiveness of U.S. aerospace producers, prime contractors such as McDonnell-Douglas and U.S. subtier suppliers. In this respect, U.S. trade policy must aim at opening and ensuring continued market access to this region. While some countries such as Singapore have been very receptive to U.S. direct foreign investment, most others have been less forthcoming. At the same time, the issue of foreign government subsidies of their aerospace industries has to be addressed, as does U.S. export financing of aerospace products should the foreign import content increase.

This concludes my testimony today. Thank you.

SENATOR BINGAMAN. Thank you very much.
Mr. Ray, why don't you go ahead with your testimony.

STATEMENT OF EDWARD JOHN RAY, DEPARTMENT OF ECONOMICS, OHIO STATE UNIVERSITY

MR. RAY. Thank you, Senator.

As I indicated in my prepared remarks, the purpose of this statement is to provide some understanding of the limited conditions that would justify government intervention into and/or the prevention of such a sale.

In the opening remarks, I indicate really three basic arguments for some sort of action. The first is the national security argument, and we've heard both sides of that. It hinges on this business of being able to separate commercial from military technology and production procedures and so forth.

I will certainly defer to people who are more expert in the industry about the capability of McDonnell Douglas or anybody else to accomplish that.

The second issue has to do with the transfer of technology, and whether or not, in some sense, the U.S. taxpayer, who has played a substantial role in financing R&D in the aerospace industry, is going to get the most bang per buck for the resources that they've put into this kind of activity.

The third justification for some form of intervention has to do with the notion that there may be adverse employment consequences of joint ventures or foreign direct investment activities undertaken by McDonnell Douglas or by any U.S. manufacturer deciding to undertake foreign direct investment activity abroad.

Let me stick mainly with the last two issues because I don't think they've been discussed quite as thoroughly as perhaps the first.

The possibility that a joint venture between private companies and different countries could be contrary to the interests of the country responsible for the innovations is greatest when the innovating company has benefited from government subsidization of its R&D effort.

And as we all know, the aircraft industry has been a major beneficiary of government support to R&D to a much greater extent than manufacturing, in general.

It might be possible for a company like McDonnell Douglas to enter into a joint production agreement with a manufacturer in a foreign country that assured the company of a high rate of return on its R&D activity, even though it represented a rather low rate of return on the overall investment effort.

What prevents that outcome generally is the fact that the company like McDonnell Douglas has a profit motive to seek out the highest bidder for the technological advantages it possesses, regardless of how those advantages were financed.

So, the first issue is whether or not the company, acting in its own interest, would in fact pursue investment partnerships that brought less than the kind of return that one would expect on the overall R&D effort.

A more sophisticated version of this issue is to suggest that there are external benefits associated with the technological breakthroughs— i.e., spillover applications to be realized in other industries—that the beneficiary may not be aware of when considering the value of a partnership abroad. Therefore, the technology might flow abroad before domestic producers have had the opportunity to make the most of their early access to that technology for their own uses.

To my knowledge, the spillover effects of technological advances associated with the construction of new aircraft are primarily captured within the aircraft and air transportation industries. Technological spillover effects are much stronger in areas such as computers, electronic components and machinery of various kinds.

So, there is this notion that somehow there are subsidiary benefits associated with the initial innovation that aren't realized by the company acting in its own interest to maximize its return on that technology. That argument of unforeseen spillover effects is probably less credible in the aircraft industry than it might be in some of these others.

So, in short, the spillover effects of technological improvements in the construction of aircraft should be fairly apparent to the innovating company. Again, the profit motive would induce the innovating firm to capture the maximum rents possible from its technological superiority, in a manner that is consistent with its national interests and with maximizing the return on privately and publicly financed investment in the aircraft industry.

Furthermore, experts in the industry should be able to explain whether or not the proposed project would involve the transfer of any sophisticated technology to Taiwan aerospace. It's my understanding, for example, that facilities to be built in Taiwan ought to deal with the production of fuselage sections and subassembly activities and that facilities will be built in the United States for the construction of other parts of the aircraft and for final assembly work.

So, we don't have a hypothetical that we're dealing with here. There is presumably a defined division of labor to be undertaken by the various branches of the joint venture. And given that proposed division of labor, it should not be difficult to ascertain whether or not state-of-the-art technological information will be shared with Taiwan aerospace.

The last concern that I want to address is whether or not the proposed joint venture is likely to create jobs in the United States.

It's a genuine concern. Expressed in the jargon of the late 1960s— for those of us old enough to remember—does U.S. foreign direct investment export jobs from the United States.

As a general matter, a number of authors have analyzed the impact of U.S. foreign direct investment on exports from the United States and on employment in the United States.

I won't mention names at this point.

But, basically, the research tends to indicate that foreign direct investment tends to be positively related to exports from an industry.

Now, one way in which we can illustrate why exports are stimulated by foreign direct investment has to do with the recent public complaints about foreign direct investment holdings in the United States, and that those foreign direct investors tend to import parts from suppliers back in their home countries rather than from competitive suppliers in the United States.

Investing in a foreign country presents many problems, including figuring out how one can obtain reliable delivery of high-quality parts for production abroad. Until and unless one discovers local sources of supply for one's intermediate product needs, it is reasonable to continue to obtain parts from traditional suppliers in the home country.

And this really is the point that was made just a few moments ago about short-term employment. It's certainly conceivable that employment effects on the United States could be positive. To the extent that business is created through this joint venture, it's more than likely that the first points of contact for supplies for that additional construction are going to be the traditional suppliers back in the United States, not suppliers outside the United States.

The proposed joint production activity by McDonnell Douglas and Taiwan Aerospace involves the production of a new wide-bodied airliner referred to as the MD-12. It is possible that that project will not be a success in the long run. I have no idea. However, it is difficult to believe that McDonnell Douglas has not made a considerable effort to identify a partner and a market location for production facilities that would maximize the likelihood of a successful and highly profitable investment.

Furthermore, McDonnell Douglas has made a plausible argument that the proposed joint venture will provide McDonnell Douglas with business ties in Asia that might lead to further profitable activities, including the sale of wide-bodied planes in the Pacific region that might not be possible in the absence of well-established business contacts there.

And that's where often the longer term positive export stimulus of foreign direct investment activity comes from. Establishing local business ties often gives one entree into markets that wouldn't otherwise be available to one in the absence of foreign direct investment activity.

The argument that the domestic production of the MD-12 would create more employment in the United States than the proposed joint venture assumes the domestic production of the aircraft is a viable, competitive option and ignores the potential spillover effects that the proposed joint venture might have for future export sales in Asia by the United States.

Denying McDonnell Douglas the opportunity to pursue the proposed joint production plan might result in cancellation of any plans to produce the MD-12.

If that is a real possibility, it is difficult to believe that government actions that prevent McDonnell Douglas from competing in the market for

wide-bodied passenger planes would be in the interest of the workers in the aircraft industry.

You mentioned earlier that you have a concern about strategic trade policies, and in some sense, it surprised me a bit that this proposed venture really fits within that broader context. In fact, so much so, that during the early part of the first panel's discussion that almost nobody mentioned McDonnell Douglas. That discussion had very little to do with McDonnell Douglas-Taiwan Aerospace and everything to do, it seemed to me, with strategic trade policy.

And I want to refer to that in the remarks that I have.

It has become fashionable in recent years to talk about strategic trade policy. Political leaders are justifiably concerned about the impact on the U.S. economy of actions like the use of subsidies by the European community to enhance the ability of Airbus to compete with Boeing for sales of wide-bodied passenger planes.

Academics like Baldwin and Krugman and Brander and Spencer have provided credible stories of instances in which countries could benefit from strategic behavior and international trade and investment.

We need not concern ourselves with generalities here, although it is worth noting that strategic trade models rarely include the possibility that strategic behavior in international economic relations might induce trade wars or retaliation by trading partners in specific markets in which the strategic advantage is not with us.

Baldwin and Krugman, to get down to specifics, analyzed the Airbus issue and concluded that the net impact of the subsidies to Airbus was to reduce profits substantially for Boeing without providing substantial profits for Airbus.

In short, the argument that one could capture extraordinary profits in international markets by subsidizing production of technologically sophisticated products seems to be misapplied in the Airbus case.

The United States has filed a complaint with GATT regarding the subsidies to Airbus. It is difficult to see how the proposed joint investment plan, which would require Taiwan Aerospace to purchase 40 percent of the newly constituted McDonnell Douglas commercial aircraft corporation for $2 billion, would undermine the case under review regarding Airbus.

There are broader concerns for Congress to address with respect to the strategic trade issue, and I gather you are considering those broader issues.

However, the case at hand does not appear to be one that invites strategic manipulation or undermines our ability to seek redress from the inappropriate use of subsidies by the European community.

Thank you, Senator.

[The prepared Statement of Mr. Ray follows:]

PREPARED STATEMENT OF EDWARD JOHN RAY

The purpose of this statement is not to promote the proposed sale of 40% of McDonnell Douglas' commercial aircraft business to Taiwan Aerospace. The purpose of this statement is to provide some understanding of the limited conditions that would justify government intervention into and/or prevention of such a sale.

The proposed sale could be viewed as contrary to the national interest if any of several conditions prevailed. First, such a sale would be objectionable if it increased the likelihood that sensitive military information would fall into the wrong hands. Second, such a sale would be unfair to the American taxpayer if it resulted in a transfer of sophisticated technology to foreign competitors before taxpayers in the United States were able to realize the full economic potential of the technology they had financed. Here I am simply referring to whether or not the sale occurs before the nation is able to take maximum advantage of the spillover effects of technological innovations that exist to varying degrees in each industry. A transfer of technology abroad might be profitable to a company that had benefitted from government financed research support but less profitable to the nation as a whole because other companies have not had enough time to develop profitable applications of the technology to their own businesses.

A third justification one might offer for preventing such a sale is that it somehow reduces employment opportunities in the United States. On the one hand, the fact that McDonnell Douglas will not employ workers in the United States to undertake the work that will be performed by employees of Taiwan Aerospace could look like a straight swap of jobs for Taiwanese workers in place of American workers. On the other hand, it is possible that in the absence of such a collaborative effort between McDonnell Douglas and Taiwan

Aerospace there would be no project. In that case, prohibiting the joint venture could mean that the proposed production of the long-range widebody MD-12 airliner would not take place at all. Absent that project, McDonnell Douglas might have to consider reducing its workforce in anticipation of reductions in military spending in the United States. The net effect of preventing the joint venture from going forward in that case would be to reduce jobs in the United States.

The first argument against the proposed sale i.e., that it threatens our national security by increasing to an unacceptably high level the risk that sensitive military secrets will fall into the wrong hands, is one that should be looked at carefully. McDonnell Douglas should be able to provide the strongest possible assurance that the proposed joint venture will not compromise the ability of McDonnell Douglas to maintain the tightest possible security on sensitive technological matters before the proposed joint venture begins. It is my understanding that McDonnell Douglas has proposed to provide such an assurance by separating its commercial aircraft business from its military contract work. It should be possible to define the degree to which the two branches of the business are integrated in order to minimize the possibility that sensitive technological material would fall into the wrong hands accidentally.

A separate issue to consider is whether or not the government has reason to believe that McDonnell Douglas has failed to take appropriate actions in the past to prevent the inappropriate transfer of sensitive technology to foreigners. If that is not an issue in this case, the focus should be on the managerial and operating linkages that will exist between the military and commercial branches of McDonnell Douglas following the present restructuring. With an adequate separation of military and commercial operations, the proposed sale of 40% of McDonnell Douglas' commercial aircraft business to Taiwan Aerospace should not represent a national security threat.

The possibility that a joint venture between private companies in different countries could be contrary to the interests of the country responsible for the innovations is greatest when the innovating company has benefitted from government subsidization of its R&D effort. The aircraft industry is unusual in the sense that as much as 80% of its R&D has been financed by the government compared to an industry average of about 50%. It might be possible

for a company like McDonnell Douglas to enter into a joint production agreement with a manufacturer in a foreign country that assured the company of a high rate of return on its R&D activity even though it represented a rather low rate of return on the overall investment effort. What prevents that outcome generally is the fact that a company like McDonnell Douglas has a profit motive to seek out the highest bidder for the technological advantages it possesses regardless of how those advantages were financed.

A more sophisticated version of this issue is to suggest that there are external benefits associated with technological breakthroughs i.e., spillover applications to be realized in other industries that the beneficiary may not be aware of when considering the value of a partnership abroad. Therefore, the technology might flow abroad before domestic producers have had the opportunity to make the most of their early access to that technology for their own uses. To my knowledge the spillover effects of technological advances associated with the construction of new aircraft are primarily captured within the aircraft and air transportation industries. Technological spillover effects are much stronger in areas such as computers, electronic components, and machinery of various kinds.

In short, the spillover effects of technological improvements in the construction of aircraft should be fairly apparent to the innovating company. Again, the profit motive would induce the innovating firm to capture the maximum rents possible from its technological superiority in a manner that is consistent with the national interest in maximizing the return on privately and publicly financed investment in the aircraft industry.

Furthermore, experts in the industry should be able to explain whether or not the proposed project would involve the transfer of any sophisticated technology to Taiwan Aerospace. It is my understanding that facilities are to be built in Taiwan for the production of fuselage sections and sub-assembly activities and that facilities will be built in the United States for the construction of other parts of the aircraft and for final assembly work. Given the proposed division of labor, it should not be difficult to ascertain whether or not state of the art technological information will be shared with Taiwan Aerospace.

The last concern I want to address is whether or not the proposed joint venture is likely to create jobs in the United States. A genuine concern, expressed in the jargon of the late 1960s, is that U.S. foreign direct investment, FDI, exports jobs from the United States. As a general matter, a number of authors have analyzed the impact of U.S. FDI on exports from the United States and on employment in the United States. Papers by Caves (1971), Lipsey and Weiss (1977), Kravis and Lipsey (1981), Ray (1977) and others indicate that foreign direct investment tends to be positively related to exports from an industry.

More recently, there have been public complaints that countries with foreign direct investment holdings in the United States tend to import parts from suppliers back in their home countries rather than from competitive suppliers in the United States. Investing in a foreign country presents many problems including figuring out how one can obtain reliable delivery of high quality parts for production abroad. Until and unless one discovers local sources of supply for ones intermediate product needs, it is reasonable to continue to obtain parts from traditional suppliers in the home country.

Furthermore, the decision to go abroad to produce goods to be supplied to that and other markets often arises because it is the only way to initiate or maintain a presence in that foreign market. Aliber (1970), Caves (1971), Gruber, Mehta, and Vernon (1967), and Vernon (1966) were among the first investigators to identify the positive links between domestic jobs and exports and foreign direct investment activities. (Much of the recent empirical work on foreign direct investment activity has focused on FDI in the United States during the last 15 years. Examples of that work include Caves (1988), Drake and Caves (1990), Mann (1989), and Ray (1989, 1991a, 1991b).)

The proposed joint production activity by McDonnell Douglas and Taiwan Aerospace involves the production of a new wide-bodied airliner referred to as the MD-12. It is possible that the project will not be a success in the long-run. However, it is difficult to believe that McDonnell Douglas has not made a considerable effort to identify a partner and a market location for production facilities that would maximize the likelihood of a successful and highly profitable investment. Furthermore, McDonnell Douglas has made the plausible argument that the proposed joint venture will provide McDonnell

Douglas with business ties in Asia that might lead to further profitable activities including the sale of wide-bodied planes in the Pacific region that might not be possible in the absence of well established business contacts there.

The argument that domestic production of the MD-12 would create more employment in the United States than the proposed joint venture assumes that domestic production of the aircraft is a viable competitive option and ignores the potential spillover effects that the proposed joint venture might have for future export sales in Asia by the United States.

Denying McDonnell Douglas the opportunity to pursue the proposed joint production plan might result in cancellation of any plans to produce the MD-12. If that is a real possibility, it is difficult to believe that government actions that prevent McDonnell Douglas from competing in the market for wide-bodied passenger planes would be in the interests of workers in the aircraft industry.

It has become fashionable in recent years to talk about strategic trade policy. Political leaders are justifiably concerned about the impact on the U.S. economy of actions like the use of subsidies by the European Community to enhance the ability of Airbus to compete with Boeing for sales of wide-bodied passenger planes. Academics such as Baldwin and Krugman (1987b) and Brander and Spencer (1983, 1987) have provided credible stories of instances in which countries could benefit from strategic behavior in international trade and investment.

We need not concern ourselves with generalities here although it is worth noting that strategic trade models rarely include the possibility that strategic behavior in international economic relations might induce trade wars or retaliation by trading partners in specific markets in which the strategic advantage is not with us. Baldwin and Krugman (1987a) analyzed the Airbus issue and concluded that the net impact of the subsidies to Airbus was to reduce profits substantially for Boeing without providing profits for Airbus. In short, the argument that one could capture extraordinary profits in international markets by subsidizing production of technologically sophisticated products seemed to be misapplied to the Airbus case. The United States has filed a complaint with GATT regarding the subsidies to Airbus. It is difficult to see how the proposed joint investment plan that would require Taiwan Aerospace to purchase

40% of the newly constituted McDonnell Douglas Commercial Aircraft Corporation for $2 billion would undermine the case under review regarding Airbus.

There are broader concerns for Congress to address with respect to the strategic trade issue. However, the case at hand does not appear to be one that invites strategic manipulation or undermines our ability to seek redress from the inappropriate use of subsidies by the European Community.

REFERENCES

Aliber, Robert Z. "A Theory of Direct Investment" in Charles P. Kindleberger (ed.) ***The International Corporation***, 1970, pp. 14-34.

Baldwin, Richard, and Paul Krugman (1987a) "Industrial Policy and International Competition in Wide-Bodied Jet Aircraft". in Richard Baldwin (ed.), ***Trade Policy Issues and Empirical Analysis***. 1988, pp. 89-135.

Baldwin, Richard and Paul Krugman (1987b) "Market Access and International Competition: A Simulation Study of 16K Random Access Memory". in Robert Feenstra (ed.) ***Empirical Research in International Trade***. Cambridge, Mass., 1987, pp. 1171-197.

Brander, James A. and Barbara J. Spencer, "International R&D Rivalry and Industrial Strategy". ***The Review of Economic Studies***, Vol. 50, 1983, pp. 707-722.

Brander, James A. and Barbara J. Spencer, "Foreign Direct Investment with Unemployment and Endogenous Taxes and Tariffs," ***The Journal of International Economics***, May, 1987, pp. 257-79.

Caves, R. E. "International Corporations: The Industrial Economics of Foreign Direct Investment," ***Economica***, February, 1971, pp. 1-27.

Caves, R. E. "Exchange Rate Movements and Foreign Direct Investment in the United States," ***Harvard Institute of Economic Research***, Discussion Paper #1383, May, 1988.

Drake, Tracey and R. E. Caves, "Changing Determinants of Japanese Foreign Direct Investment in the United States." ***Harvard Institute of Economic Research***, Discussion Paper #1483. May, 1990.

Gruber, Mehta and Vernon, "The R&D Factor in International Trade and the International Investments of United States Industries," ***The Journal of Political Economy***, February, 1967. pp. 20-37.

Kravis and Lipsey, "The Location of Overseas Production and Production for Export of U.S. Multinational Firms," ***The Journal of International Economics***, May, 1982. pp. 201-23.

Lipsey and Weiss, Foreign Production and Exports in Manufacturing Industries," ***The Review of Economics and Statistics***, November, 1981. pp. 488-94.

Mann, Catherine L., "Determinants of Japanese Direct Investment in U.S. Manufacturing Industries," ***Board of Governors of the Federal Reserve System***, International Finance Discussion Paper #362, September, 1989.

Ray, Edward John, "Foreign Direct Investment in Manufacturing," ***The Journal of Political Economy***, April, 1977. pp. 283-97.

Ray, Edward John, "The Determinants of Foreign Direct Investment in the United States: 1979-85." in Robert Feenstra (ed.) ***Trade Policies for International Competitiveness***, NBER, University of Chicago Press 1989. pp. 53-77.

Ray, Edward John, (1991a) "Foreign Takeovers and New Investments in the United States," ***Contemporary Policy Issues*** Vol. IX, April, 1991. pp. 59-71.

Ray, Edward John, (1991b) "A Profile of Recent Foreign Investment in the U.S.," ***Annals of the American Association of Political and Social Scientists*** #516 July, 1991. pp. 50-65.

Vernon, Raymond, "International Investment and International Trade in the Product Cycle," ***The Quarterly Journal of Economics***, May 1966. pp. 190-207.

SENATOR BINGAMAN. There's one other witness who has arrived since we began this panel and whom we would like to hear from now. David Mowery is an associate professor of business and public policy at the Haas School of Business at the University of California at Berkeley.

Mr. Mowery, thank you for being here, and why don't you go right ahead.

STATEMENT OF DAVID C. MOWERY, HAAS SCHOOL OF BUSINESS, UNIVERSITY OF CALIFORNIA, BERKELEY

MR. MOWERY. Thank you, Mr. Chairman. I apologize to you and to my fellow witnesses, but it's not a great day for flying out there, appropriately enough.

I think my testimony echos much of what I've overheard so far this afternoon, and I will be quite brief in summarizing it and just filling in a few blanks or a few points on which I think additional information might be useful.

I should also note that at the outset that I think we don't yet have a complete picture of what the structure is, who all the players are, and what the general outlines of this agreement may assume.

We're still looking here at a bit of a moving target.

But let me just briefly talk about the motives and the extent to which this agreement constitutes a departure or a continuation of a well-established trend, and briefly talk about some potential effects, and then some policy issues.

I suspect, along with several other witnesses, I see this agreement as really a continuation of an established trend in the United States and in the global aerospace industries of transnational teaming for several reasons. First, the very high costs of developing new commercial aircraft and new commercial aircraft engines, particularly in the large transport segment—i.e., more than 100 seats.

Second, the need, which is particularly important for U.S. producers, to penetrate foreign markets where demand is growing more rapidly than in the United States, and where access is often, shall we say, restricted because of the highly political nature of the global market for commercial transports.

Finally, and increasingly as this and other ventures between U.S. and foreign firms suggest, the skills, and the manufacturing expertise, to a limited degree, and the low-cost capital are frequently and more available offshore. And as a result, we've seen that General Electric, Pratt & Whitney of United Technologies and Boeing, all have over the last ten-plus years been deeply involved with foreign firms in the development, manufacturing and marketing of engines and airframes.

So, I see the Taiwan Aerospace-McDonnell Douglas agreement as an extension, in some ways, an expansion, but not a significantly discontinuous, if you will, change in this trend.

We certainly have examples in both the General Electric and Pratt & Whitney ventures where the U.S. firms are in fact—the Pratt & Whitney venture, at least—where the U.S. firm is a minority equity holder in the joint venture. That concerns one product only. This venture potentially could concern several.

Nevertheless, I see this as an extension rather than as a departure. And I think that we need to recognize, and I'm sure I'm echoing other witnesses here, that the independent, go-it-alone development of an all-new—as opposed to a modification—airframe or engine is simply increasingly impossible in this particular segment.

Moreover, the record in the airframe side of the industry, both with this venture and with previous ventures involving the Boeing commercial aircraft corporation, suggests that U.S. subcontractors and suppliers have historically been unwilling for reasons that I think have very little to do with antitrust to participate as risk-sharing subcontractors with the U.S. prime contractors in developing new aircraft.

So, in many respects, U.S. firms face a situation in which domestic partners are relatively scarce, in which market access and the availability of capital make foreign partners particularly attractive, and the results are a web of these transnational ventures.

What are some potential effects? Again, I think, along with other witnesses, we need to distinguish between the technology transfer possibilities and the impacts on competition or entry of new firms into the aerospace industry.

The structure, as I understand it, of this venture suggests to me that the transfer of McDonnell Douglas's civil aerospace technology to the Taiwanese partners is likely to be quite limited outside of manufacturing technology.

Again, we're dealing here with a very junior partner in Taiwan, in the technological sense. McDonnell Douglas is likely to take the lead on most of the development and is certainly taking the lead on the front end, the cockpit, and the overall systems integration.

These are, in many respects, the highest value-added pieces of the technology. These activities and portions of the airframe are those in which transfer through a joint venture is likely to be most pronounced.

And as I understand this joint venture in its current structure, joint development will be less important than joint manufacturing. McDonnell Douglas will take the lead in most of the development.

With respect to the transfer of dual-use or technologies with significant military implications, again, I think we're dealing at this point with an industry where the spillovers from military to civil applications generally are quite low. We're dealing with a firm in the form of McDonnell Douglas in which the fighter aircraft business, in which they have been heavily involved, is quite separate from Long Beach, both geographically and organizationally, and is quite separate technologically.

The extent of spillovers there, I think, is quite modest.

With respect to the C-17, which is a project going on in Long Beach at Douglas, I think that here again you're dealing with a military transport with which you're undoubtedly more familiar than I that will operate in a very different environment than the prospective environment for the MD-12.

So, I think that the possibility of significant transfers of military technology through this venture is quite low. Moreover, there do exist precedents for controls on the transfer of military-related technologies through other joint ventures—notably, the General Electric-SNECMA joint venture in engines.

Third, is this venture likely to result in Taiwan Aerospace's entry into the prime contractor level of the commercial aerospace industry?

Again, I think, in view of the limited technology transfer, the extremely high financial costs of entering this industry, where you're talking about individual development projects running in the neighborhood of $3 to $4 billion, those being built on an established web of infrastructure and capabilities, that itself has taken many years to accumulate.

The costs of entry here are extraordinarily high. And, therefore, I think that Taiwanese entry as an independent or as a significant competitor at the so-called prime contractor or assembler level is unlikely.

I think also that we need to recognize, as I said earlier, the global market for commercial transports is a highly political market. And it's likely that any all-Taiwanese entry into this industry would face significant obstacles to access to foreign markets, particularly given the small size of the Taiwanese economy.

I think, nonetheless, as several other witnesses have suggested, entry by Taiwan into the component and assembly tier of the industry will be made more likely and advanced by this venture.

But in contemplating that, again, I think we need to look at the alternatives available to McDonnell Douglas and at the alternatives that might occur, or the alternative scenarios that might prevail, absent this venture.

We could face the possibility of McDonnell Douglas gradually exiting the commercial air transport industry and certainly not developing the MD-12. McDonnell Douglas's failure or decision not to develop the MD-12 could have the result of bringing Airbus into the very large 400-seat transport segment of the market, which, arguably, could be forestalled as a result of the successful entry by McDonnell Douglas and Taiwan Aerospace.

Similarly, one could face the possibility of a significant expansion or link between Taiwan Aerospace and Airbus as a result of the failure of the McDonnell Douglas-Taiwan Aerospace venture to come off.

Finally, as I suggested earlier, the alternative of enlisting U.S. suppliers and subcontractors as partners does not seem to have been very attractive to those partners, judging from several pieces in the business press.

So, the alternatives to this venture, with respect to McDonnell Douglas and with respect to the employment consequences, I think are largely negative. That is to say, the consequences of McDonnell Douglas not

pursuing this venture are likely to be more negative with respect to employment in Long Beach and employment in the aerospace industry than are the consequences of McDonnell Douglas pursuing this venture.

What are some policy issues? Again, I think that we've covered some of these. The major near-term effect of entry, I believe, will be felt primarily by U.S. suppliers rather than by the prime contractors. That's the major near-term effect of entry by Taiwan Aerospace into this industry. And here, as Ms. Evans suggested, we are dealing with a sector of the industry where there seems to be a good deal of overlap between military and civil products and technologies. We're dealing with a sector of the U.S. aerospace industry about which we know relatively little.

There have been a number of studies done for the defense industrial base and very few of them present us with reliable data on a national level concerning the effects of transnational teaming on this supplier sector.

Nevertheless, I think that the focus in dealing with the supplier tier has to be to improve the technological capabilities in this sector, and that can be done both by improving the outreach of existing Department of Defense and NASA research programs, and also could be done by expanding more general federal efforts in the area of technology extension and adoption support; an area in which I know you've been interested in, and an area in which I think federal technology policy that has over the last 4 decades been notably deficient in contrast to our technology policy in the agricultural sector.

There are two other areas, I think, in which this venture raises some implications that are worth noting.

We need, I think, in contemplating the consequences of joint venturing and commercial aerospace, and in considering whether some form of restriction or some form of controls would be justified, we need to keep in mind that joint ventures and transnational teaming are not occurring only in commercial aerospace between U.S. and foreign firms. They're occurring across a broad array of industries, ranging from steel and autos to semiconductors and computers.

There is a good deal of technology that comes into the United States, as well as a good deal of technology that goes out of the United States through these ventures. And focusing exclusively on a single sector, I think, and raising the possibility that transferring technology in a single sector is detrimental to national economic welfare, overlooks what is a much broader two-way flow and two-way interaction of technology transfer across a much broader array of industries. And this reflects the fact that the United States in the current global economy is first among equals, but is no longer, I would argue, a technologically hegemonic economy.

That is to say, the gap between U.S. and foreign firms in development, and certainly in the adoption of new technologies, has narrowed considerably.

I think, among other responses and among other options for responding to the consequences of these joint ventures, pro-active and positive steps

to strengthen the technological capabilities of U.S. suppliers are likely to be less distortive with respect to their international trade consequences and, in the long run, far more attractive than the possibility of restricting transnational collaboration.

Finally, a great deal, I'm sure, has been said about Airbus in the context of this venture. But we do need to keep in mind that more than just Airbus is at work here as a cause or as a competitive pressure on U.S. prime contractor firms in motivating these ventures.

We have seen a great deal of collaboration on the engine side of the industry, a side of the industry without a comparably well-financed foreign competitive threat.

And I think also we need to keep in mind, in looking at the threat of Airbus, we need to look across different sectors of U.S. high technology industry in thinking about the consequences of U.S. policy and in thinking about the ability of the United States to discipline or control foreign subsidy programs.

And here I would argue that whatever the programmatic merits and the performance of a venture-like Sematech that we need to recognize that the motives and the justification for federal support of Sematech, in many respects, looks similar to at least some of the rationalizations advanced by European governments for supporting the Airbus consortium: avoiding dependence on foreign suppliers, preserving a strategic industry, and preserving an industry with important military consequences.

So, I think we need to keep in mind that as this government--correctly, in my view--takes a very hard line in trying to discipline the subsidies extended to Airbus that this opposition, in some cases, may become more difficult than in other sectors as we go further down that path.

Thank you.

[The prepared statement of Mr. Mowery, together with an attachment, follows:]

PREPARED STATEMENT OF DAVID C. MOWERY

The recently announced agreement between Taiwan Aerospace Corporation and McDonnell Douglas Corporation has attracted considerable attention. The precise terms of the agreement have not yet been disclosed, but it is likely to involve the purchase of a 40% share of the equity of a new corporate entity that contains Douglas Aircraft's commercial aircraft operations by a group of foreign investors that may include representatives from other East Asian nations, in addition to Taiwan. The joint venture of East Asian and U.S. firms will undertake the development and manufacture of the MD-12, a 400-seat commercial transport that will compete with the Boeing 747. In addition, this entity will manage the manufacture, marketing, and support of Douglas Aircraft's current commercial aircraft product line.

A thorough analysis and evaluation of the implications of this agreement requires further information on its structure and aims. Nevertheless, I believe that this agreement is unlikely to result in the entry by Taiwan or other East Asian firms into the "prime contractor" tier of the global commercial aircraft industry. The politicized nature of world markets for large commercial transports would make independent entry by these nations, many of which already face restrictions on their access to foreign markets for exports of machine tools, textiles, steel, and consumer electronics, virtually impossible. In addition, the costs of independent entry into commercial aircraft development and manufacture are exorbitant, and the technology transfer that will occur over the life of the MD-12 venture is unlikely to provide the requisite skills and assets to support independent entry.

In my opinion, the organizational relationship between most of the military aerospace activities of McDonnell Douglas and Douglas Aircraft is sufficiently distant, and the technologies of commercial transports and most of McDonnell Douglas's military aircraft so unrelated, that the purely military implications of this venture also are likely to be modest in the near term. This agreement nonetheless will accelerate foreign entry into the subcontractor and supplier tier of the aerospace industry, and thereby may intensify competitive pressure on U.S. supplier firms.

The McDonnell Douglas agreement is a response to the new realities of global competition in the commercial aircraft industry. It holds the potential to ensure the survival of Douglas Aircraft, even as it may make life more difficult for other U.S. firms. Nevertheless, the agreement is more an effect, rather than a potential cause, of intensified foreign competition in this industry.

Why do U.S. and foreign firms collaborate in commercial aircraft?

The McDonnell Douglas agreement is only the latest in a series of joint ventures and "strategic alliances" between U.S. and foreign firms in the commercial aircraft and engine industries.[1] Indeed, McDonnell Douglas has been surprisingly slow to emulate the activities of organizations like General Electric's aircraft engine group, Pratt and Whitney's commercial aircraft engine division, or Boeing's commercial aircraft division, all of which have been entered into agreements with foreign partners or risk-sharing subcontractors for development projects since the early 1970s.

These agreements have transferred U.S. commercial aerospace technology to foreign firms, but thus far have not produced competitors to the major U.S. "prime contractors" in commercial aircraft and engines, and appear unlikely to do so in the near term. There are three primary motives for international collaboration in this industry: (1) access to foreign markets; (2) access to capital; and (3) access to foreign sources of technology and manufacturing expertise. The first two of these motives are the most important in the McDonnell Douglas agreement.

Foreign market access is important to U.S. aircraft and engine firms, because air travel demand is expanding more rapidly offshore, and because the enormous costs of developing a new aircraft or engine (in the case of the MD-12, as much as $4 billion) require the broadest possible market for their recovery. Access to foreign markets is often facilitated by enlisting a local firm as a partner or supplier. This reflects the fact that governments exercise great influence in the global market for commercial aircraft and engines, since they often own or influence the operators of flag carriers. Participation in the MD-12 project by firms from Taiwan, Singapore, South Korea, and other East Asian nations could improve Douglas's access to a very rapidly growing market for commercial aircraft, a market whose growth exceeds that projected for the domestic U.S. market.

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[1] See D.C. Mowery, Alliance Politics and Economics: International Joint Ventures in the Commercial Aircraft Industry (Cambridge, MA: Ballinger Publishers, 1987); T.H. Moran and D.C. Mowery, "Aerospace," Daedalus, Fall 1991.

Given the high costs and risks associated with developing a new commercial aircraft or engine, the importance of foreign, low-cost sources of capital is obvious. The risks and costs associated with developing a new airframe or engine arguably have increased for U.S. firms during the past 4 decades, for several reasons. Military procurement and defense-related aircraft R&D no longer appear to yield the civilian "spillovers" that they once did. In addition, the ability of U.S. domestic carriers to finance and participate in early-stage development of new aircraft and engines has declined somewhat in the wake of deregulation of domestic air transport in 1978. In the McDonnell Douglas and other agreements between U.S. and foreign aircraft firms, foreign government subsidies to foreign firms have lowered their cost of capital and added to their attractiveness as partners for U.S. enterprises.

Foreign manufacturing and technological expertise provides a third attraction for U.S. firms to seek out partners offshore. Especially in joint ventures involving "risk-sharing subcontracting" arrangements, U.S. firms often are able to obtain more favorable financing and production agreements from foreign partners than U.S. supplier firms are willing to extend. Moreover, to the extent that their collaborative activities result in the entry or strengthening of foreign suppliers, U.S. "prime contractor" firms may benefit from intensified competition among their suppliers.

In most respects, the McDonnell Douglas agreement appears to resemble those establishing joint ventures or risk-sharing subcontracting relationships between other U.S. aircraft or engine firms and foreign partners. For example, the International Aero Engines partnership involves Pratt & Whitney (a division of United Technologies) and six foreign aircraft engine firms (from Great Britain, Italy, Germany, and Japan) in a joint venture dedicated to the development, manufacture and sale of the V2500 engine. Pratt and Whitney's equity share in this enterprise is well below 50%. CFM International, the joint venture between General Electric and the French aircraft engine firm SNECMA that produces the successful CFM56 engine series, also divides equity ownership between the partners almost equally. Even the Boeing 777 project, in which a 3-firm Japanese consortium holds a 20% equity share, is likely to involve other foreign firms in developing and producing components and assemblies that will account for a significantly larger share of the value of the aircraft.

Arguably, the McDonnell Douglas agreement is unique in granting a significant ownership share in a number of different products to a foreign firm--i.e., Taiwan Aerospace may be involved in manufacturing and marketing for the MD-80 and MD-11 aircraft, as well as the MD-12. The implications of this involvement for technology transfer nonetheless are likely to be small. In its significant provisions and likely structure, the McDonnell Douglas agreement represents a modest expansion in a well-established trend

toward internationalization in the global aerospace industry.

Economic and technology-transfer effects of the MCDAC-Taiwan agreement

There are several potential causes for concern about the effects of the McDonnell Douglas agreement: (1) the possibility that sensitive technologies of military significance may "leak out" to potential U.S. military adversaries or regional aggressor governments; (2) the possibility that foreign participants in this joint venture may acquire the technological capabilities necessary to independently enter the development and production of large commercial transports; and (3) the possibility that high-wage U.S. aerospace jobs will move offshore as a result of McDonnell Douglas's production-sharing agreements with foreign enterprises. In my view, the dangers of each of these possibilities are overstated.

As I noted earlier in my statement, military and civilian aircraft technologies now exhibit less commonality than was true in the early postwar era. Certainly, the airframes of the military fighters that have long been a McDonnell Douglas specialty face an operating environment that differs radically from those of large commercial transports. Indeed, the lack of strong technological synergies between the military fighter and civil transport activities of McDonnell Douglas may be inferred from the organizational and geographic separation of these corporate operations. Some design, materials, and production technologies in the C-17 project may be relevant to the MD-12, but even these are likely to be modest. The C-17 and MD-12 also are designed for very different operating demands and environments.

Even if some military technological advances are embodied in the MD-12, there exists ample precedent for U.S. government control of the transfer or disclosure of "dual-use" technologies within joint ventures between U.S. and foreign aerospace firms. The GE-SNECMA joint venture mentioned above utilized an engine core technology that drew heavily on General Electric's military F-101 engine.[2] Pentagon officials were able to negotiate restrictions on any disclosure by GE to SNECMA of key details of this component. If the McDonnell Douglas agreement does involve sensitive military airframe technologies, similar controls on transfer or disclosure could be considered.

Will the Taiwan-McDonnell Douglas agreement produce new entrants into the world commercial aircraft industry, "giving away the future" of U.S. firms and employees? More information on the structure of the proposed venture is necessary in order to develop a definitive verdict, but the non-U.S. firms will be most heavily

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[2] See Mowery, Alliance Politics and Economics, pp. 80-85.

involved in portions of the MD-12 project in which technology transfer is lowest. The limited technological capabilities of Douglas's foreign partners mean that they are likely to participate mainly as financiers and manufacturers--overall design, development, and systems integration on the MD-12, as well as the design and manufacture of the cockpit and final assembly of the entire aircraft, almost certainly will remain the responsibility of Douglas Aircraft. Development and design, not manufacturing, are the phases of any aircraft development project in which technology transfer among joint venture partners is greatest. Airframe manufacturing technology is widely distributed throughout the global economy (in numerous cases, as a result of U.S. government-sanctioned coproduction agreements, or "offset requirements" in sales of military aircraft), but this manufacturing technology per se is a less critical source of competitive advantage in the industry.

Moreover, independent entry into the commercial aircraft industry would be exorbitantly expensive, requiring an investment substantially in excess of the $2 billion reportedly advanced by Taiwan Aerospace for its equity share in Douglas Aircraft. The high risks and development costs associated with this industry strongly suggest that additional independent "prime contractors" will be very unprofitable. Instead, Douglas Aircraft's prospective Asian partners are likely to emerge over the next decade or two as important risk-sharing partners in development projects conceived and managed by the current "prime contractors" in the global airframe and engine industries.

Such a development is unlikely to threaten Douglas, Boeing, Airbus, or established U.S. producers of engines. The emergence of additional foreign subcontractors and suppliers nevertheless will increase competitive pressure on the so-called "second tier" of the U.S. aircraft industry, the domestic subcontractors and suppliers. This group of firms has benefitted from the internationalization of the commercial aircraft industry, inasmuch as U.S. exports of components have grown rapidly since the early 1980s.[3] In the long term, however, this group of firms must improve their technological and financial strength in order to compete with a growing array of foreign suppliers. Too little is known about the economic viability of these firms or the structure of the supplier segment of the U.S. commercial aircraft industry, but there are a number of firms within this second tier that supply both military and civil aircraft firms and projects.. Military and civil technologies and suppliers may overlap more within the supplier

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[3] According to the 1988 and 1990 editions of the Commerce Department's U.S. Industrial Outlook, the value of U.S. exports of "aircraft equipment not elsewhere classified" (which includes both military and civil aircraft components) grew by more than 9% annually during 1980-86, and by 11-12% annually during 1987-89.

sector than in other sectors of the U.S. aerospace industry.

Finally, assessing the potential employment effects of this agreement requires a careful delineation of the alternatives; i.e., what are the likely consequences of a failure by McDonnell Douglas to find a foreign risk-sharing partner? Most accounts of these negotiations suggest that potential U.S. partners (e.g., Lockheed[4]) were not interested in a joint venture, despite the lack of antitrust obstacles to such collaboration.

If an agreement with Taiwan Aerospace or another foreign entity cannot be reached, McDonnell Douglas almost certainly would begin a gradual exit from the commercial aircraft industry, imperilling much of its U.S. commercial aircraft employment. In addition, the Asian risk-sharing partners would be free to seek out other collaborators, including Airbus Industrie. The failure of McDonnell Douglas to pursue development of the MD-12 also could entice Airbus to develop a 400-seat (or larger) aircraft. Although its Taiwan Aerospace agreement is likely to result in fewer jobs than an arrangement in which Douglas Aircraft undertook independent development of the MD-12, this alternative is infeasible. Not even the Boeing Corporation, which is far stronger financially than Douglas Aircraft, would undertake such a project without some risk-sharing partners.

Conclusion

The agreement between Taiwan Aerospace and McDonnell Douglas is only the latest in a series of joint ventures between U.S. and foreign firms in the aerospace industry. These agreements reflect the fact that markets and sources of product and manufacturing expertise in this industry now are truly global. Simultaneously, the financial risks associated with developing new aircraft and engines are too great for any single U.S. or foreign firm to manage. In addition, the global market for commercial aircraft and engines is sufficiently politicized that foreign participation in development and marketing ventures aids access to foreign markets for U.S. firms.

The presence of Airbus Industrie has added urgency to these motives for international teaming in the commercial aircraft industry, but

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[4] See D.J. Lynch, "Lockheed Rejected Douglas' Overtures," Orange County Register, 11/22/91. Despite frequent allegations that U.S. antitrust policies constrain collaboration among U.S. firms, this account suggests that Lockheed's reluctance to pursue a joint venture with McDonnell Douglas as a risk-sharing partner reflected purely commercial considerations: "'Lockheed was interested only as a subcontractor, not as a serious equity partner,' said Paul Nisbet of Prudential-Bache." (p. D1).

the presence of a subsidized foreign competitor is not the central cause of these international arrangements. After all, U.S. engine manufacturers have also chosen international risk-sharing partners for most of their recent civil product development and manufacture efforts, despite the absence of such a competitive threat.

The McDonnell Douglas agreement highlights the dilemmas of trade and investment policies in global, dual-use industries. One of the key reasons for foreign governments' desire to nurture a domestic aerospace manufacturing capacity, after all, is the perception that a domestic aerospace industry is an important economic and national security asset. U.S. government opposition to Airbus subsidies is difficult to reconcile with U.S. government financial support for high-technology technology development programs in other industries, such as semiconductors. Regardless of the merits of Sematech as a technology development program, the justification for its support with federal funds uncannily echoes the rationale for European governments' support of Airbus Industrie. In addition, the foreign partners of U.S. firms in other international commercial aircraft joint ventures often benefit from various home-government loans and grants, effectively lowering the cost of risk capital for the U.S. firms.

The global nature of markets for the products of U.S. aerospace firms further complicates the U.S. government's policy response to foreign subsidies. A countervailing duty on Airbus products, for example, will provide little relief for U.S. aircraft producers, who face the most intense competition from Airbus in foreign markets. In the likely event of retaliatory action, a CVD could harm U.S. firms. Similar considerations make a Section 301 action against Airbus an unattractive option.

The economic arguments against this and other international joint ventures in commercial aircraft devote too little attention to credible alternatives to collaboration. The military/national security arguments may deserve a more serious hearing, although those based on "spillovers" from military to civil aircraft and engine technologies at the "prime contractor" level do not stand up to serious scrutiny. If the allegedly negative effects of international collaboration on U.S. supplier firms are to be taken seriously, a much more thorough analysis of the economic and technological strength of this sector is needed. If such a study exposes serious weaknesses, what options are available to federal policymakers?

Existing civilian and defense-related aerospace research and technology development programs historically have not served these supplier firms effectively. More might be done to improve the outreach of these programs to the supplier base, especially small and medium-sized firms within this sector. In other respects, however, the putative problems of U.S. aerospace supplier firms resemble those of U.S. manufacturing firms in other industries.

U.S. technology "policy" during the postwar period generally has devoted far too little attention to supporting the adoption and implementation of advanced manufacturing technologies within civilian industry (in sharp contrast to U.S. technology policy in agriculture). The potential weakness of the aerospace supplier sector (keeping in mind that this weakness has not been definitively demonstrated) and other U.S. manufacturing industries stems in part from slow or ineffective adoption of new technologies. Underinvestment in the skills of entrants and members of the production workforce exacerbates the problems faced by many U.S. firms in adopting new technologies. In other words, any competitive weakness in this sector is attributable largely to domestic causes; solutions to such problems therefore should focus on domestic policies and initiatives.

Rather than resisting the internationalization of this and other high-technology industries, a more desirable course of action would seek to improve the competitiveness of our aerospace supplier firms, to ensure that they will remain important players in the global aerospace industry of the future. In this and other industries, achievement of this goal may well require the development of a U.S. technology policy that achieves a better balance between encouragement for technology creation and support for technology adoption.[5] Such initiatives also may induce less distortion in international flows of trade, investment, and technology than many alternative policies. In the global economy of the 1990s and beyond, coordination and consistency between U.S. technology and trade policies will become even more important to the success of policies in each sphere.

[5] See D.C. Mowery, "The Challenge of International Trade to U.S. Technology Policy," presented at the Symposium on Linking Trade and Technology Policies, National Academy of Engineering, Washington, D.C., June 10-11, 1991.

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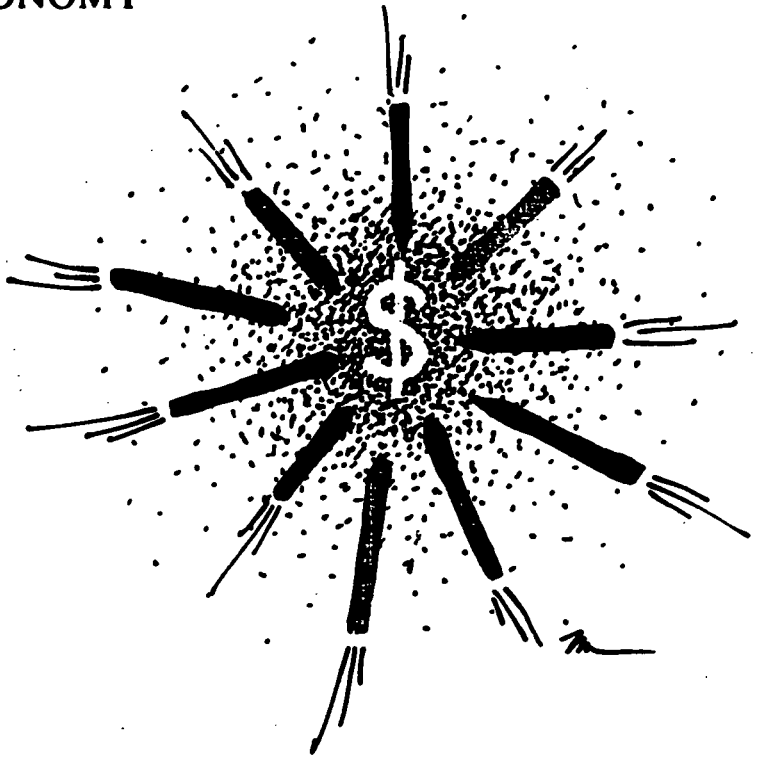

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Aerospace

SINCE THE EARLIEST YEARS OF THE AEROSPACE industry, national governments have protected and promoted their domestic aerospace firms for reasons associated with national welfare and national security. In recent decades, however, the need to capture the economies of large-scale production and a growing need to gain access to foreign technologies and markets have propelled the principal US and European aerospace manufacturing firms beyond their national borders.

This trend has intensified a familiar debate in countries aspiring to a major role in the aerospace industry: how to manage the movement across their borders of the goods, services, capital, and technology that the industry requires in order to promote their national interests. As usual, the debate has revealed two camps: one that draws on the standard liberal prescriptions of easy access and freedom of choice as a means of bringing efficiency and dynamism to the industry; and a second that draws on so-called neomercantilist recommendations, entailing use of the state to strengthen national firms and keep control over the industry.

NATIONAL POLICIES IN RETROSPECT

Europe led the United States in many of the technological and commercial aspects of the aerospace industry prior to World War II. Because the US industry has had such a dominant position in world

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markets in recent times, however, it is useful to first look at the influence of US policies on the global structure of the industry.

US Policies

As early as 1915, the aircraft industry in the United States was distinguished by the US government from other US manufacturing industries by the existence of a federally funded program for research in generic civil and military technologies. Directed by the National Advisory Committee on Aeronautics (NACA), the program made important contributions to civilian and military aircraft design and technologies during the interwar period. NACA research, for instance, aided the US aircraft industry in some notable successes before World War II, such as the launching of the DC-3.

When measured by its technological and commercial achievements during this period, however, the US commercial aircraft industry was far from dominant in world markets. The early development of the turbojet engine and the swept wing was undertaken by European scientists and engineers. Indeed, one scholar has suggested that the United States lagged so badly in theoretical aerodynamics before World War II that US aerospace technicians and engineers were incapable of recognizing the potential of the jet engine.[1]

During and after the war, however, the technological sophistication of the US aircraft industry greatly improved. In 1958, the newly organized National Aeronautics and Space Administration (NASA) took over responsibility for the research program. The NASA research budget was dwarfed during the postwar period by an enormous military investment in aerospace research and development that took place through other channels. Yet, the NASA program played an important ancillary role throughout the period.

In addition, US industry benefited by technology transfers from wartime allies, along with the emigration of skilled scientific personnel from Europe. The buildup of military R&D programs in the early 1950s was particularly impressive; measured in 1990 dollars, military R&D expanded from roughly $4 billion in 1950 to more than $14 billion in 1952,[2] generating important benefits for the US commercial aircraft industry. A large share of the technology developed for the engines and airframes of the long-range military bombers and tankers of the early 1950s had important commercial applications, helping to lay the foundation for the Boeing 707.

During the postwar years, the perceived importance of the aerospace industry for US national security also led the US government to intervene directly in order to rescue military aerospace contractors threatened with bankruptcy. When Douglas Aircraft ran into trouble in the mid-1960s as a result of its problems in the commercial aircraft market, federal loan guarantees and favorable antitrust reviews supported the shotgun marriage of Douglas to McDonnell, creating McDonnell Douglas. In 1971, the Lockheed Corporation, faced with bankruptcy as a result of cost overruns in the development of its wide-bodied L-1011, was rescued by a federal loan guarantee of $250 million. As one analyst concluded in his study of the civil and military aerospace industry, "the [federal] government simply will not allow a major defense contractor to fail completely, whatever its commercial sins."[3]

One of the most important forms of public support for the postwar development of the civil aerospace industry in the United States was unplanned and indirect. Until 1978, federal regulation by the Civil Aeronautics Board restricted competition among interstate airlines, limiting new entries and price discounting. During the regulated era, competition was based primarily on service and quality, spurring the major airlines to vie with one another to place orders for new generations of commercial transports. This competition induced the rapid adoption of new aircraft technologies. In the process, US producers of airframes and engines exploited their proximity to the largest civilian market in the world to build a dominant position. Thereafter, they used their technological and financial dominance as a kind of springboard for exports, a strategy commonly used by Japanese producers in other export sectors.

However, the internal sources of stimulus and support for the American aerospace industry eventually began to decline. Deregulation of domestic airlines in 1978 strained the financial capacities of competing lines and removed one of the incentives for early adoption of new aircraft. The aggregate expenditures of NASA and the Department of Defense on aeronautics research, when measured in real terms, leveled off and even declined slightly after 1975.[4] With the exception of a few technologies such as avionics, technological spill-overs from military to civilian sectors became less important. Cases began to appear that indicated a reversal of the previous relationship between military and civilian technological develop-

ment; the KC-10 military tanker, for instance, owed much of its technology to the commercial DC-10. It was evident that the US aerospace industry had entered a new era.

Europe and Japan

As we observed earlier, other industrial democracies also invested considerable public resources in the sustenance or revival of their postwar national aerospace industries. During the 1950s and 1960s, governments in Britain and France encouraged a succession of complex mergers, seeking to create "national champions" in the civilian and military sectors of the industry. In the process, the British and French governments took equity positions in a number of key firms, provided extensive financial support for R&D programs, and followed heavily preferential policies in the purchase of aircraft. Japan and West Germany followed similar policies.[5]

The technological performance of some of the favored firms was impressive. The first turbojet-powered commercial transport, the Comet, was introduced by the British DeHavilland Corporation in 1952, six years before Boeing introduced the 707. In the civilian aerospace sector, however, efforts to sustain national champions proved very difficult, as soaring development costs gave the advantage to countries with the largest domestic markets. As development costs increased, France and Britain encountered mounting problems in lining up the advance orders and amassing the development funds needed to launch each new generation of aircraft.[6]

Despite continued attempts to support their national champions with subsidies and buy-at-home policies, the problems of the French and British industries continued to grow. In the 1950s and 1960s, only one of Britain's twelve commercial aircraft projects, the Viscount, proved commercially successful. The competitive position of Britain's major airlines, BEA and BOAC, was undermined by the pressures to buy national products and to forego better and cheaper aircraft. French government policy scored a partial success with the short-range turbojet Caravelle during the 1950s, exploiting the gap left by the longer-range 707 and DC-8; however, the Caravelle was displaced by the Boeing 727 when it appeared in 1962.

The Japanese government also discovered the drawbacks of a limited domestic market during this period. The Ministry of International Trade and Industry (MITI) supported the development in 1959

of a sixty-seat turbo-prop aircraft, the YS-11, by a consortium of domestic producers. The aircraft was a technical success but a commercial failure. Production ceased in 1974 after a nine-year run, with delivery of only 182 planes, mostly to domestic carriers.[7]

Recognizing the limitations of small domestic markets for commercial aircraft, European policy makers developed a regional approach, characterized by heavy government participation and support. France and Britain collaborated in the development of the supersonic Concorde, which entered commercial service in 1976. Once again, however, the plane was a technological success but a disastrous commercial failure. With an eventual development cost that was ten times the original estimate of $450 million, production was terminated in 1979 after delivery of only sixteen aircraft, all of them sold to the state-owned French and British airlines.

In the 1960s, another major pan-European consortium, Airbus Industrie, was launched and experienced a rocky beginning. The British, French, and German participants each initially tried to use the project to sustain their own national aircraft industries. These pressures and a cumbersome management structure increased project costs, hindered decision making, and generated a design that had little appeal for prospective buyers, resulting in a lack of orders and a financial crisis.[8] The British government withdrew from the consortium in 1969, and Airbus was reorganized under the technical and managerial leadership of its French participants. The ambitious technical goals of the early designs were modified and non-European components were given a larger place in the production plans. In 1975, the completion of the A300 signalled the entry of Airbus Industrie as an important producer of commercial aircraft. And in 1979, the British rejoined the Airbus consortium.

US government sources estimate that since the consortium's creation, it has absorbed as much as $12 to $15 billion dollars in public funds but has yet to yield a net profit.[9] Nevertheless, Airbus has become a significant competitor to the existing US commercial airframe firms. In the period from 1986 to 1990, for instance, Airbus accounted for 15 percent of the deliveries of commercial jet aircraft to noncommunist markets, while the two surviving US firms—Boeing and McDonnell Douglas—accounted for 81 percent. But at the beginning of the 1990s, the order backlog of Airbus was considerably higher than its share of sales, running at about 30 percent, and raising

the possibility that it might increase its share of sales in the future at the expense of its US competitors.[10]

Confronting a European consortium, US firms looked for alliances that might strengthen their financial position and technical resources. Their responses built on earlier international collaborations stretching back over three decades.

The Spread of International Alliances

International collaboration in the aerospace industry first appeared in the production of military aircraft, in arrangements among the NATO allies and with Japan. From 1947 to 1980, at least twenty-eight US aircraft, missile, or rotorcraft designs were manufactured by foreign firms in more than twenty nations under licenses granted by US producers. These coproduction agreements enabled European and Japanese firms to improve or sustain their aerospace production capabilities, but because these agreements did not include the design and development of aircraft, they resulted in the transfer of only a limited range of skills and technologies.

During the 1960s and 1970s, the governments of the larger Western European democracies occasionally explored the possibility of collaborating in the development and production of military aircraft in order to overcome some of the same financial constraints that were limiting their commercial industries. Trans-European collaboration included a French-British helicopter program, the German-French Transall transport aircraft, the British-French Jaguar fighter aircraft, and the British-German-Italian Tornado multirole combat aircraft.

Although these projects allowed for a sharing of costs and technology, the development and production costs of the military aircraft produced in trans-European programs tended to be higher, and their development schedules considerably longer, than comparable US programs. Even when compared with national military programs in Europe, the trans-European programs appeared to be generating somewhat higher costs and slower deliveries.[11] These disappointing results were due in part to disagreements over design and performance objectives, and to differences over the sharing of the benefits, that were endemic to trans-European projects. Still, the advantages of cost-sharing and of avoiding US domination seemed sufficient to justify the projects in the eyes of the participants.

During the 1970s and 1980s, European governments also demanded a greater role in the development of the military aircraft they were purchasing from the United States. Pressure from foreign allies for codevelopment was not confined to European governments; the agreement between the US and Japanese governments to collaborate in developing a new fighter, the FSX, arose out of the same trend in policy. Codevelopment agreements allowed Japanese and European enterprises to collaborate with US aerospace firms on the "upstream" activities of R&D and design. These demands intensified at a time when the United States itself was eager to reduce the development costs of its weapons systems and wished to encourage standardization in the myriad weapons systems deployed by NATO. In 1986, the drive for codevelopment received an additional impetus in the form of congressional legislation that encouraged multinational cooperation in weapons development in an effort to reduce military expenditures.[12]

Another strategy adopted by foreign governments to increase their share of the business generated by military aircraft production was to demand a greater role in the production of the components for the aircraft they were purchasing from US sources. These demands led to the development of numerous offset agreements between US producers and foreign firms in Europe and elsewhere. One of the most celebrated examples of the use of offset agreements involved the F-16, a product of US-based General Dynamics. At stake was "the sale of the century," a huge prospective order from NATO forces. Faced with the prospect that several European governments might try to develop an indigenous military fighter to rival the F-16, General Dynamics agreed to assign a major production role to domestic firms in prospective purchaser nations. This role included the production of components not only for the aircraft sold to European nations but also for the aircraft sold to the US Air Force. For instance, European producers in Belgium, Norway, the Netherlands, and Denmark, in addition to being offered control of 40 percent of the production expenditures for planes sold to their respective governments, were also offered control of 10 percent of the cost of the planes delivered to the US Air Force and 15 percent of the cost of planes sold elsewhere. Aided by such arrangements, with the backing of leading Belgian and Dutch aircraft firms, General Dynamics was able to win the contract over strong competition.

Another celebrated example of the role of offsets in the sale of sophisticated military equipment involved Boeing's sale of AWACS aircraft to NATO. Boeing's strategy of seeking partners throughout NATO enabled it to defeat the competing entry, the all-British AEW Nimrod.[13] On paper, the initial Nimrod proposal—advanced by the British team of national champions, composed of Hawker Siddeley Aviation, Marconi-Elliot Avionic Systems, and Rolls Royce—seemed to promise distinct technological and price advantages over AWACS; however, the Nimrod aircraft could not match the technical performance of the Boeing AWACs, illustrating the weaknesses of limiting an aerospace company to suppliers from a single nation. Moreover, without allies among manufacturers in other countries, the marketing of the Nimrod proved a failure. After spending $1.6 billion, the British government was forced to terminate the project in recognition of the fact that Boeing's ability to draw on technology and marketing assistance from allies and partners around the world gave it a giant edge over a purely national aircraft.

For the US government and aerospace industry, offset agreements have always evoked a mixed reaction. Their desire to penetrate foreign markets for both political and economic reasons has struggled with a desire to limit foreign access to some of the technologies contained in military and civilian high-technology products like aircraft. Before 1978, offset agreements in military aircraft sales were largely negotiated on a government-to-government basis, indicating the mix of economic and political motives underpinning them.[14] By the 1990s, they had become a mainstay in sales of both military and civil aircraft to foreign governments and foreign firms and in sales to both industrialized and industrializing countries. As foreign producers have improved their technological capabilities, the products and technologies subject to offset agreements have increasingly involved highly advanced US technologies in both military and civil applications.[15]

The strategy of building multinational support among suppliers to ensure market penetration has become even more critical in the commercial sector, in part as a result of the intense competition between Boeing and Airbus. In the manufacture of the A300, for example, Airbus procured over 50 percent of the plane's components from US manufacturers, thereby capturing both their technology and their political support. At the same time, Boeing's choice of Rolls

Royce for engines in the 757, and of Aeritalia for airframe production in the 767, aided sales in the European market, even as the participation of Japanese firms in the manufacture of the 767 has helped Boeing to dominate the Japanese commercial aircraft market.[16] As Boeing's president noted, "If we were to bleed off all of the aerospace production, we'd get a backlash that would cause more trouble than sharing to a degree."[17]

By the 1990s penetration of foreign markets had become more important than ever for US producers of commercial aircraft. Industry executives were projecting that the demand for commercial air transport would grow more rapidly abroad than in the United States, consistent with trends that were visible in the 1980s.[18] In prospect, therefore, was an increasing emphasis on foreign partnerships. Complex consortia like General Electric's partnership with France's SNECMA, as well as Pratt & Whitney's partnership with Rolls Royce and an array of Japanese and other European firms, appeared to offer a preview of the future structure of the industry.

Prime contractors in civil airframes and engines have been driven not only by a desire to penetrate foreign markets but also by an interest in expanding the array of suppliers that compete for contracts and in spreading a share of the development costs and risks. Higher development costs create stronger incentives for risk-sharing; broad corporate alliances reduce the need to "bet the company" on each new generation of products. Boeing's arrangements with Mitsubishi, Kawasaki, and Fuji Heavy Industries have enabled it to reduce its risks and to maintain a near monopoly on sales to Japanese airlines. The V2500 engine consortium, by including Japanese firms, reduced the financial exposure of Rolls Royce and Pratt & Whitney, allowing them to continue to offer a "full line" of new engines for commercial airframes. The costs of the V2500 engine project were particularly onerous because it had no military counterpart that could defray a share of the development and testing expenses, illustrating the changing relationship between military and civil technologies in the industry.

Although the consortium approach has served to create a foreign presence in national aerospace industries, firms in the industry have been far less prone to establish multinational networks of subsidiaries than have firms in other technology-intensive industries. Aerospace firms have sometimes offered to produce their products through

subsidiaries on foreign soil, but only as a last resort; the lure of China's market, for instance, led Boeing and McDonnell Douglas to offer to produce aircraft in that country.[19] But the cost penalties of operating multiple production facilities in commercial aircraft, combined with the pressures from their home governments to maintain a national defense base, have led firms in the industry to resist a multinational structure.

Nonetheless, because military and commercial aircraft involve the integration of so many complex subsystems and components, and because many of them are sourced internationally, the "nationality" of the final product has become increasingly difficult to establish, creating complex implications for policy. For example, the US government provides Export-Import Bank subsidies for the sale of Boeing 757 airframes to foreign buyers, even though many of them specify that British Rolls-Royce engines must be incorporated in the aircraft. The US government also has protested the excessive generosity of European government subsidies for the sale of the Airbus A300, despite the fact that this aircraft often employs General Electric engines. Which policy more effectively supports US income and employment growth? In the modern commercial aircraft industry, it is hard to know.

TRENDS AND PORTENTS

Although every country with an aerospace industry identifies that industry as critical to its defense planning, the aerospace industry has not escaped the globalizing trends that have engulfed large segments of the world's industrial structure. In moving toward a global structure, however, the industry has exhibited some distinctive patterns reflecting its unique status in national defense, its heavy reliance on technological change, and its strikingly concentrated industrial structure.

Leading firms have employed a number of tactics to maintain a technological edge while collaborating with erstwhile rivals. US firms, for instance, have limited the transfer or disclosure of critical elements of their technology to their foreign partners. In the development of its 767 with Japanese partners, Boeing has sought to safeguard its testing processes and software needed for redesign as well as many of the "black boxes" of the aircraft used in the cockpit

navigation systems. General Electric took similar precautions in its joint development of an engine with SNECMA, although some of its restrictions arose from the fact that the engine involved drew part of its technology from a military engine developed for the Department of Defense. Pratt & Whitney also imposed tight restrictions on technology transfer within the V2500 engine venture, albeit with costly consequences. Although the V2500 was designed so as to minimize the need for exchanges of proprietary technology among participants, problems in integrating the separately developed engine components led to severe delays in the testing and introduction of the engine. Bolstering these efforts at secrecy, leaders of some international consortia have routinely obtained commitments limiting their partners' independent use of any acquired technologies for some stated period in the future.

US aerospace industry leaders also have sought to maintain their competitive advantage by a variety of devices: achieving scale economies through the standardization of components and designs across different types of aircraft and engines, developing a global network for providing services and spare parts, phasing in the introduction of new products so that the learning processes and cash flows of earlier products could support those that followed, and so on. Boeing has been particularly assiduous in pursuing such strategies, but other leading US enterprises have diligently applied such strategies as well.

The defenses of leaders against the entry of rivals, however, have been less than perfect. Both McDonnell Douglas and Airbus have courted the Japanese, hoping to capture support for their attempts to end Boeing's dominance of sales to airlines in Japan. An open-ended agreement in 1990 between Mitsubishi Heavy Industries, the largest Japanese aircraft company, and Daimler Benz, West Germany's largest industrial group, raised the possibility of a link between the Japanese aerospace consortium and the Airbus consortium. This prospect has increased the pressure on Boeing to be more forthcoming to its Japanese partners.

Well before the Daimler-Mitsubishi agreement was announced, the president of Boeing Commercial Airplanes observed that the Japanese "are going to become involved in a commercial jet program one way or another. We sure don't want them to get involved with Airbus."[20] Consistent with his statement, Boeing was already expanding the role of its Japanese partners in the development and

manufacture of its commercial aircraft. In the 767 project, the Japanese consortium, comprised of Mitsubishi Heavy Industries, Fuji Heavy Industries, and Kawasaki Heavy Industries, provided low-level design and advanced manufacturing services and skills. The Japanese consortium planned also to play a more prominent role in the development of the successor 777, as well as becoming involved for the first time in marketing and sales finance. Clearly, the Japanese were making some progress toward MITI's long-term goal of developing a domestic commercial aircraft industry.[21] Similarly, in the V2500 joint venture for aircraft engines among Pratt & Whitney, Rolls Royce, and others, Germany's MTU and Italy's Fiat were assigned a more important role than they had previously occupied in such projects.

In military aircraft, Japanese firms have improved their manufacturing skills through coproduction partnerships with the United States. The FSX project with General Dynamics builds on a series of coproduction agreements that include the F-3, F-4 and F-15, all of which were manufactured by Japanese firms under license from US firms. The role assumed by the Japanese in the FSX, however, includes overall system design, development, and integration, going beyond any previous US-Japanese agreement in military aircraft. This expanded role notwithstanding, the FSX project is devoted to modifying a fighter airframe design that is at least twenty-years old, while the FSX engines will be US designs that are manufactured under license in Japan.

Yet, despite the fact that a globalization trend has been visible in both military and civilian aerospace throughout the postwar period, the supportive links that existed between the two sectors during much of that period appeared to decline in the 1980s. As was noted above, the technological and commercial support that military developments had provided to civil aircraft, such as the boost that the KC-135 had given to the B-707, seems unlikely to occur again in the future. Moreover, the viability of the fifteen hundred firms that supply military and civil aerospace firms increasingly depends on their fortunes in the commercial segment of the aerospace industry.[22] These US supplier firms are especially vulnerable to intensified competition resulting from the international joint ventures of US producers of military and civilian aircraft.

By the 1990s, the prospect of a sharp decline in expenditures on conventional and strategic weapons systems, coupled with the apparent existence of considerable excess capacity among the subcontractors who supply both the commercial and military sectors, pointed to the strong likelihood of shrinkage in the industry.[23] Faced with increased pressure on their domestic aerospace industries, foreign governments may well try to stiffen their buy-at-home requirements, especially in the acquisition of military products. As they do so, however, they will run head-on into the technological and financial imperatives that have obliged enterprises to develop their cross-border alliances. The resulting tensions will fuel national debates in the United States, Europe, and Japan over the policies to be pursued in maintaining a military and civilian capability in aerospace.

This struggle is likely to take a familiar form, a battle between those who see advantages in the government's taking an aggressive promotional role in the development of key industries and those who prefer to leave the field to market forces. Among political scientists and economists, the debate will array those who espouse a liberal approach against those who prefer more neomercantilist attempts to construct an active national industrial policy.

In the case of the aerospace industry, the industry's distinctive characteristics are likely to make this debate especially intense. The large economies of scale and important "first mover advantages" in this industry provide powerful pressures toward the domination of world markets by a handful of firms. A market structure of that sort would create incentives for governments to resort to strategic, predatory, or preemptive policies.[24] Moreover, with such domination, the leading firms in the industry will increase their ability to delay, deny, exploit, and extort; when the leading firms are located abroad, they will present a potential for foreign *diktat*.[25] Faced with such a threat, critics of conventional laissez-faire economics in Europe and Asia, as well as in the United States, will argue that national security planners can hardly afford to be agnostic about the nationality of suppliers and the location of production.

Public officials in Europe have already emphasized the point that extraordinary barriers exist to the entry of new firms into the industry, a consequence of the complexity of the technology, the size of the requisite financial commitments, and the early lead of American firms. Both the Europeans and the Japanese are fully aware that

overcoming such barriers may entail extraordinary levels of public subsidy and protection.[26]

Observing the long-term policies of the United States, industrial planners in Europe and Asia may be excused for feeling that the exhortations from US policy makers for all nations to embrace a nonintervention ist approach are disingenuous. In the end, Europe and Japan are unlikely to respond to such exhortations by reducing their efforts of the past few decades to develop an indigenous aerospace capability.

On the US side, both the military and the commercial considerations for resisting the spread of the industry outside US territory will have great persuasiveness in terms of jobs and exports and in terms of national defense. The debate over aerospace policy will be intertwined with ideological struggles over the appropriate use of public power. Arguments as to whether the United States should consciously adopt an industrial policy for the aerospace industry and the phalanx of related industries that support it are embedded in the larger question of governmental intervention in the structure of industry and the conduct of foreign trade. The arguments on all sides have already been so thoroughly developed that it is easy to envisage their structure.[27]

On one side, US proponents for an active industrial policy will argue that the aerospace industry, by virtue of the required scale and the critical importance of learning-by-doing, cannot be expected to respond to market forces in the constructive ways that Americans usually associate with competitive industries. In this view, the need for continuity and momentum is so critical for the survival of the industry that its fate cannot be left to the vicissitudes of supply and demand. Moreover, observing the likely policies of other countries in promoting an independent aerospace industry, proponents will argue that the United States cannot anticipate that an open competitive market or level playing field will be available in international markets.

In rejoinder, those in the United States who resist the idea of formulating an industrial policy for the industry will point to what they regard as a dismal and costly record of the governments that have attempted it. They will emphasize that government intervention for economic and national security reasons in other US industries, including steel, machine tools, and semiconductors, has burdened the

US aerospace industry with much heavier costs than those borne by European and Japanese competitors.[28] They will insist that the US federal structure of checks and balances, when coupled with the standard US requirement that bureaucrats must operate under close supervision and with limited discretion, is incompatible with granting the extensive powers to the bureaucracy that are implied by a supple industrial policy, such as choosing technologies and managing the distribution of benefits among winners and losers.

Another ideological issue that is likely to figure in the US debate is whether the trade and investment of US aerospace firms should be supported by the policies explored in the new literature on strategic trade theory. Under this theory, governments may be able to use domestic protection and export subsidies to establish and retain the critical advantages of first mover and dominant producer, thereby establishing international supremacy for their own national firms.[29] With scale economies and learning-by-doing occupying so critical a role in the international aerospace industry, the temptation for any government to follow such a course is evident.

Equally relevant, however, is the likely reaction on the part of governments exposed to the threat of dependence on concentrated foreign suppliers in key industrial sectors. Concerns about finding themselves at the mercy of foreign monopolists have motivated the efforts of governments in Europe and Japan to build up their own aerospace sectors. In the United States, the same fear exists: a fear that foreign firms, backed by their governments, might try to use cross-border relationships with US firms, such as the FSX and Boeing-Mitsubishi arrangements, as the first step in an effort to dominate the field.

Applying the principles of the prisoner's dilemma, theorists have recognized that in the end, the efforts of governments to seize and hold a dominant position could lead to stalemate. In order for the policy to succeed, rival governments must remain passive, accepting the existence of blocked markets and continuing to keep their own markets open. The most likely outcome of the application of strategic trade theory in a given sector, it was concluded, would be retaliation by the governments in that sector or some other sectors in which they enjoyed an advantage.

What could easily be overlooked in these debates about industrial policy and strategic trade theory, however, is the extent to which the

evolution of the technology and industrial structure of the industry itself circumscribes the choices for future public policy. By the 1990s, the United States no longer possessed an internal market large enough to provide a protected national environment for the technological development and production learning required for a new family of aircraft. National requirements in the civilian market were beginning to appear insufficient to sustain the giant risks that any innovating firm would have to take in order to launch such an undertaking. At the same time, lacking a protected home market large enough to support new generations of aircraft, the costs to Europe or Japan of providing subsidies large enough to maintain an aerospace champion firm were becoming prohibitive. Given the costly example of Airbus, a repetition of that kind of undertaking seemed increasingly improbable. Moreover, neither the United States nor Europe nor Japan could count on a national lead in all of the major technologies required for the launching of a new family of aircraft.

Thus, although one cannot altogether rule out the long-term possibility of the emergence of a new national aerospace champion, supported by one or more governments, a more likely pattern of development will be the continuation and extension of cross-border consortia, composed of a number of firms of different nationalities. That pattern, if it developed, would serve to reduce the ability of any one country to engage in predatory behavior.

On the other hand, the effects of governmental policies on the distribution of the ancillary industries supporting the aerospace industry are less clear. In this arena, a government's aggressive use of subsidies or other devices associated with industrial policy and strategic trade theory could well provide it with some leverage. As we have already observed, aircraft manufacture entails the integration and assembly of an array of complex components. Moreover, the components frequently are employed in both military and civilian applications, so that the threat of a foreign government's control over supply could be seen as a major problem.

As for major airframe and engine producers, the policy problems they present may well prove to be of a very different kind. In their case, the networks that they have developed to deal with the problems of scale and risk have begun to create conditions in which the discipline imposed by market competition may be losing its bite.

Until the early 1990s, governments were prepared to tolerate cross-border partnerships, coproduction arrangements, and joint ventures whose basic purpose was to ensure vigorous penetration of each others' markets. Ultimately, however, the trend toward international partnerships could be used by firms and governments alike to freeze the structure of the industry with a global market-sharing arrangement. It could well be that the most pressing problems for the United States, Europe, and Japan in the decades ahead, therefore, will be to find ways of preserving the technological drive and the incentive for efficiency in the industry that competition would ordinarily be expected to provide.

ACKNOWLEDGEMENTS

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ENDNOTES

[1]Edward Constant, *Origins of the Turbojet Revolution* (Baltimore: Johns Hopkins Press, 1980), 198.

[2]D. C. Mowery, *Alliance Politics and Economics: Multinational Joint Ventures in Commercial Aircraft* (Cambridge: Ballinger, 1987), 41.

[3]S. L. Carroll, "The Market for Commercial Airliners," in R. E. Caves and M. J. Roberts, eds., *Regulating the Product* (Cambridge: Ballinger, 1975), 162. See also D. C. Mowery and N. Rosenberg, "The Commercial Aircraft Industry," in R. R. Nelson, ed., *Government and Technical Progress* (New York: Pergamon, 1982), 113.

[4]See A. March, "The U.S. Commercial Aircraft Industry and Its Foreign Competitors," *Working Papers of the MIT Commission on Industrial Productivity*, vol. 1 (Cambridge: MIT Press, 1989), 87.

[5]For additional discussion, see K. Hayward, *Government and British Civil Aerospace* (Manchester, U.K.: Manchester University Press, 1983); Mowery; and M. S. Hochmuth, "Aerospace," in R. Vernon, ed., *Big Business and the State* (Cambridge: Harvard University Press, 1974). Although dated, Hochmuth's discussion provides useful historical detail; however his favorable verdict on French aerospace policy has not been borne out by subsequent developments.

[6]See Hochmuth, "Aerospace," 150; Mowery.

[7]See D. C. Mowery and N. Rosenberg, "Competition and Cooperation: The U.S. and Japanese Commercial Aircraft Industries," *California Management Review* 27 (1985): 70–82.

[8]See the discussion of Airbus in Mowery; or K. Hayward, *International Collaboration in Civil Aerospace* (London: Frances Pinter, 1986).

[9]For an estimate of Airbus subsidies, see P. Krugman, "The Effects of Foreign Industrial Targeting," *Brookings Papers on Economic Activity* (Washington, D.C.: Brookings Institution, 1987); or Gelman Research Associates, *An Economic and Financial Review of Airbus Industrie*, report prepared for the International Trade Administration, US Department of Commerce (Washington D.C.: Department of Commerce, 1990).

[10]See "Zoom! Airbus Comes on Strong," *Business Week*, 22 April 1991, 48–50. Data on order backlogs often include options of varying degrees of firmness in addition to firm commitments and therefore are much less reliable than deliveries data as indicators of market share.

[11]K. Hartley, *NATO Arms Co-operation: A Study in Economics and Politics* (London: Allen and Unwin, 1983); M. Rich, W. Stanley, J. Birkler, and M. Hesse, *Multinational Co-production of Military Aerospace Systems* (Santa Monica, Calif.: RAND, 1981). E. Kolodziej's account is revealing: "A former senior French official suggested a formula for estimating the costs of a cooperative program. These are equal to the cost of a national program times the square root of the number of participants. . . . Delays can be measured by multiplying the length of time of a national program by the cube root of the number of cooperating members." (E. Kolodziej, *Making and Marketing Arms* [Princeton: Princeton University Press, 1987], 150.)

[12]See E. Kapstein, "International Collaboration in Armaments Production: A Second Best Solution," *Political Science Quarterly* (forthcoming).

[13]Daniel Todd and Jamie Simpson, *The World Aircraft Industry* (London: Croom Helm, 1986); Arnold Lee Tessner, *Politics of Compromise: NATO and AWACs* (Washington, D.C.: National Defense University Press, 1988); "Airborne Early Warning: Two Major Systems for Europe," *Interavia: World Review of Aviation* (September 1980); and "Boeing Makes Final Bid for British Contract, Offers to Plow Profits Back into Nation," *New York Times*, 12 November 1986.

[14]J. Cole, "Evaluating Offset Agreements: Achieving a Balance of Advantages," *Law and Policy in International Business* 19 (1987): 765–809.

[15]J. Gansler, *The Defense Industry* (Cambridge: MIT Press, 1980), 205.

[16]See Hayward or Mowery.

[17]"Boeing Takes a Bold Plunge to Keep Flying High," *Fortune*, 25 September 1980.

[18]See National Research Council, *The Competitive Status of the U.S. Civil Aviation Industry* (Washington, D.C.: National Academy Press, 1983); and V. Lopez, *The U.S. Aerospace Industry and the Trend toward Internationalization* (Washington, D.C.: Aerospace Industries Association, 1988).

[19]S. Carey, "China Seen Set to Decide on Aircraft Job," *Wall Street Journal*, 19 February 1991, 11A.

[20]George Tibbits, "Boeing Sees 767-X Talks as Latest in Long Term Relationship with Japanese," The Associated Press, 1 November 1989.

[21]See Industrial Bank of Japan, *The Vision of MITI Policies in the 1980s* (Tokyo: Industrial Bank of Japan, 1980), 291.

[22]In the 1985 report of the National Research Council the US Civil Aviation Manufacturing Panel noted, "The 15,000-company supplier base is an important key, since these firms supply critical materials and parts to both the civil and military aircraft industry. Frequently, in the case of smaller second- or third-tier suppliers, the military and civil production outputs are sufficiently common that the same facilities and labor pools produce both." *The Competitive Status of the U.S. Civil Aviation Manufacturing Industry* (Washington, D.C.: National Academy Press, 1985), 99.

[23]"If procurement spending in defense declines over the long-term, there will not only be fewer new project starts in this sector, but the ability of these firms to get well will decline too. The resulting squeeze between increasing risk taking by contractors and declining compensation should force some firms to leave the business (or move into other lines of defense work), bringing supply into line with demand." (T. McNaugher, *New Weapons, Old Politics* [Washington, D.C.: Brookings Institution, 1990], 175); see also J. Gansler.

[24]Some sense of the magnitude of scale and learning-based cost improvements is conveyed by the calculation that the per unit cost of a hypothetical 150-seat commercial airliner drops 70 percent by the two hundredth sale before leveling off. This estimate was prepared by the US Department of Commerce in cooperation with McDonnell Douglas and is cited in Richard Baldwin and Paul Krugman, "Industrial Policy and International Competition in Wide Bodied Jet Aircrafts," in Robert Baldwin, ed., *Trade Policy Issues and Empirical Analysis* (Chicago: University of Chicago Press, 1988).

[25]Theodore H. Moran, "The Globalization of America's Defense Industries: Managing the Threat of Foreign Dependence," *International Security* 15 (1) (Summer 1990).

[26]See Mowery and Rosenberg, "Competition and Cooperation."

[27]See, for instance, testimony of Arden Bement, Pat Choate, Stephen Cohen, and Robert Kahn: US Congress, US Senate, Committee on Governmental Affairs, *Government's Role in Economic Competitiveness* hearings, 100th Cong., 1st sess., 25 March–7 April, 1987 (Washington, D.C.: US Government Printing Office, 1987); US Congress, US Senate, Committee on Governmental Affairs, *Economic Competitiveness, International Trade, and Technology Development Act of 1987*, report, 100th Cong., 1st sess., 23 June 1987 (Washington, D.C.: US Government Printing Office, 1987); and US Congress, House, Subcommittee on Economic Stabilization, Committee on Banking, Finance, and Urban Affairs, *Defense Production Act Amendments of 1988*, hearings, 100th Cong., 2d. sess., 30–31 March 1988 (Washington, D.C.: US Government Printing Office, 1988). See also, Stephen S. Cohen and John Zysman, *Manufacturing Matters: The Myth of the Post-Industrial Economy* (New York: Basic Books, 1987); and Clyde V. Prestowitz, Jr., *Trading Places: How We Allowed Japan to Take the Lead* (New York: Basic Books, 1988).

[28]The Stern Group, *Rebuilding American Manufacturing in the 1990s: The Case against Steel VRAs* (Washington, D.C.: The Stern Group, February 1989); US International Trade Commission, Investigation No. 332–149 under sec. 232 of the Tariff Act of 1930, *Competitive Assessment of the U.S. Metalworking Machine Tool Industry* (Washington, D.C.: ITC, September 1983); report to the US Congress by the Secretary of Defense in July 1989, *The Impact of Buy American Restrictions Affecting Defense Procurement* (Washington, D.C.: Department of Defense, 1989); and Stuart Auerbach, "U.S. Chip Industry Rivals Wire Together an Alliance," *Washington Post*, 14 August 1988, H6.

[29]See, for example, James A. Brander and Barbara J. Spencer, "Export Subsidies and International Market Share Rivalry," *Journal of International Economics* 18 (February 1985); Paul R. Krugman, ed., *Strategic Trade Policy and the New International Economics* (Cambridge: MIT Press, 1986); J. David Richardson, "Strategic Trade Policy," *International Organization* 44 (1) (Winter 1990); and Avinash Dixit, "International R&D Competition and Policy," in A. Michael Spence and Heather A. Hazard, eds., *International Competitiveness* (Cambridge: Ballinger, 1988).

SENATOR BINGAMAN. Thank you very much.

We have one other witness who was supposed to be on this panel and who has just arrived. So, let's ask him to come forward.

Let me make sure that I've the current pronunciation—Mr. Modzelewski who is a financial analyst with Paine Webber.

We appreciate you fighting your way through the weather to be here. Why don't you go ahead and summarize your statement for us, if you would, please?

STATEMENT OF JACK MODZELEWSKI, FIRST VICE PRESIDENT AND SENIOR AEROSPACE ANALYST, PAINE WEBBER

MR. MODZELEWSKI. Thank you, Mr. Chairman. It was certainly a struggle to get here, but it's my pleasure to be here.

My name is Jack Modzelewski. I'm a senior aerospace analyst at Paine Webber.

This is an extremely important area for America and extremely important to the stocks that I cover at Paine Webber. It's also very complicated in terms of a public policy issue.

As I go through my comments today, I do want to reiterate that these are my own comments. Obviously, in this context, I'm not speaking for the firm. But I am talking and we do advise investors as to what our position is relative to this transaction. It is a significant one. I would not view it as something in a continuum kind of nature.

I think, if you look at the stock prices of the companies that were affected by this, they have acted and reacted quite vehemently to this new announcement.

So, in a certain sense, this was a surprise to the markets. I think that it's a material event and that this type of a hearing is certainly appropriate.

Mr. Chairman, from a public policy perspective, I can assure you that the financial markets are extremely interested in this transaction. The stock market value of Boeing and McDonnell Douglas stock, which I think are the two principally affected stocks in this transaction, approximate $20 billion. This is more value than the stock of all of the defense companies that I follow in the whole defense industry.

Both of these issues are extremely important high-value, actively traded stocks. And their prices have reacted to this announcement that has been made recently.

The stock market is looking at other participants' response in the industry, and we can presume that their decisions will not be done in a vacuum.

Quite frankly, it's also looking at what the U.S. government response will be.

Again, regarding public policy issues, while we're neutral to public policy formation in general, certainly, there are public policy issues here,

and to the extent that they are acted on, I think they can have a material impact on the price of these stocks.

The commercial aircraft industry is unique. It's very hard to analyze. Ask Bob Hood, president of Douglas Aircraft, following me; it is very hard to manage. I think it's very difficult to set public policy for. It's a unique industry, and I think most of the reasons have already been articulated, but let me go through some of them.

I think this is a very high barrier to entry business. It has some unique characteristics that make it different from other industries, such as steel, autos, textiles, etc., where we have lost our dominance. This has very high barriers to entry; we have 75 percent of the world market.

One has to question what type of investments are being made in this area.

The first thing you look at, and it's been mentioned before, is high development costs. It's extremely expensive to develop aircraft. Five billion dollars is a minimum investment just in the development process for a new aircraft.

It has very low-unit volumes. This year is a record year. We're looking for 850 airplanes worldwide to be delivered. And we're looking at capacity of around a thousand.

If we go back 10 years ago, the industry was delivering about 250 airplanes a year. So, it's very low volume, but with a very high cost to develop each aircraft.

You have significant learning curves. And certainly, Mr. Chairman, you're familiar with learning curves—as each new aircraft gets produced, it is produced at a significantly lower price than the previous aircraft.

These three factors—high-development costs, low-unit volumes and significant learning curves—what do they tell you? They tell you that to make a profit, to have an economic rate of return in this industry, you have to have market share. And, in fact, you've had very low rates of return in this industry over the last 20 years. Airbus has lost in excess of $10 billion developing their product. McDonnell Douglas in the past 20 years has admitted to losing at least $1 billion.

The only company that has consistently made money in this industry is Boeing. Boeing has put significant investment in this industry. They have 55 percent of the market. And it appears, at least from any type of analysis of this industry, without market share, it is very, very difficult to earn an economic rate of return.

That leaves us with the question: What is the motivation for investment that comes into this industry?

If you look to it, right now, if you see the high cost, the low-unit volumes, the learning curves, the low rates of return that are commensurate with this industry, the question then is why are we having this investment? And I think that in the context of the Taiwanese $2 billion investment that the first question that can be asked is what's the motivation of it? Is it purely for an economic rate of return?

And I think that's the issue in front of the Committee. And the Taiwanese are not the only investments that are coming into the area. Airbus announced at the Paris Air Show that they were going to be launching a $5 billion program for a 600-seat aircraft. Deutsche Aerospace has intimated that they, outside the Airbus consortium, want to launch a 130-seater, which we estimate would cost $2 billion. Fokker has raised the specter of launching a 70- and 130-seat aircraft, which will cost at least a billion dollars.

The issue here is why? What types of rate of return are being presented in this industry that is attracting this kind of investment?

And I would suggest to you that there are alternative reasons that we can develop: there is technology advancement; there is national pride, there is employment; there is critical skill maintenance and development which has direct applicability to defense technologies.

Therefore, when you find other countries developing aircraft, I do not believe that that rate of return is the necessary prerequisite in developing aircraft and putting investment into it.

U.S. industry, particularly Boeing and McDonnell Douglas, both are being asked to generate rates of returns, or I will commensurately downgrade the stock, and they lose. They have to have a rate of return or their stock price suffers.

Boeing, at the present time, is involved with the development of the 777 aircraft. It is costing nearly $4 billion to develop, and I assure you that they're developing out of profits. It's affecting their bottom line, and I think that it is affecting their stock price right now. Longer term, I think that stock prices will reflect these types of investments, and for Boeing, it has.

But the point is that American industry, when we develop aircraft, it's out of profits. I do not believe that's the case when we're dealing with foreign government investments in the development of aircraft, which puts the United States at a critical disadvantage.

When we look at the present transaction here, and you look to what McDonnell Douglas is doing, they find themselves in the third position behind Boeing and Airbus. The same elements that we talked about that hurt rates of return, the low-unit volumes and so on, right now, McDonnell Douglas is capturing less than 15 percent of the commercial aircraft market. This market share makes it very difficult for them to develop aircraft and to be able to amortize the development cost and so on over a large enough base.

I think that the same issues that have kept other entrants out of this business, or certainly tends to keep investment out of this industry, are now impinging upon McDonnell Douglas.

If you look to their actions, relative to this Taiwanese investment, I would suggest that it is rational behavior from their perspective. It is certainly within the board's and shareholders' best interest.

And I think that the stock price has reflected it. In 1991, alone, McDonnell Douglas's stock is up 80 percent relative to the market, which

is up about 15 percent, and relative to Boeing's stock, which is actually down a percent or two.

I think this is a fair assessment of what's going on in terms of the commercial aircraft industry right now. And that is that McDonnell Douglas, with this proposed transaction, has become, or is certainly in the process of becoming, a viable competitor in the industry.

The longer term issue relative to their stock price is, will they be able to prosper? It's a very difficult question right now because I think that they're going to continue to be in the third position relative to commercial aircraft. And as I said earlier, I think that that market share is the key determinant for ultimate profitability in this industry.

When you examine the transaction of the Taiwanese Aerospace proposed joint venture into McDonnell Douglas, I think the key question—less so from Wall Street's perspective, but certainly I think from a public policy perspective—the question has to be raised, is this at-risk capital, and is it being invested for a fair rate of return?

I have looked at the transaction, and right now, as many of the other people have pointed out, the final details have not yet been disclosed. But it would appear that $2 billion for this piece of McDonnell Douglas is not unreasonable. There is a rate of return to it. It is low right now. It is certainly less than a money market rate of return, and it looks right now to be in the area of 3 to 4 percent.

There's extreme risk attached to this investment—the going forward in the development of aircraft.

I cannot on the surface of it say that this money is being invested for other noneconomic reasons. Certainly the rate of return is low, but one cannot say that it is so low that it necessarily pushes you to say that this is being invested for other than economic purposes.

The final reaction to this whole process, which is important—certainly from Wall Street's and investors' perspectives—is that we are struggling with what's going to be the competitive and governmental response to this.

I think the first thing is that, interestingly enough, if this venture takes place, and I think this joint venture will be approved, what could happen is that the Fokker developments, the Deutsche Aerospace development, and other participants who are thinking about investing in this industry will be very hard pressed to come up with any type of economic return.

So, it could preclude and actually force out some of that type of investment.

I think that after the equity infusion that you're still going to have Boeing as number one. I think Airbus will continue to be number two, and they will both be extremely aggressive relative to market share.

So, one can presume that there will be price cutting. One can presume that margins within the industry will be under pressure as a result of this.

I'm not saying that that's necessarily bad, but remember, it will then be only Boeing that is forced to develop new aircraft out of profits. And profits in the aerospace industry, if they are under any type of competitive

pressure from this type of venture, certainly, in a sense, start to weaken the long-term viability of Boeing to continue to develop new aircrafts, which they have done very successfully and have done out of profits.

The last issue that I want to address is what's the U.S. government response to this?

I probably have the same type of view that others do. I find no specific transfer of military technologies in this venture. I think that the Douglas aircraft commercial division has been separated from the military side for quite some time, both in terms of technology and production techniques. I do not find from the surface of this, in looking at this transaction, I do not see that as an issue.

I also do not see any clear public policy alternatives that can address this issue. We have proposed in our written testimony certain things as additional R&D tax credits, and possibly relaxing antitrust issues relative to Boeing making an investment. I think that's appropriate. Antitrust is a very small public policy issue relative to the one we're addressing here.

But, in general, our advice to our investors is, and has recently been here, is that public policy is unlikely to block this process. And with that, we believe that McDonnell Douglas stock, which has been up, will continue to trade up as the details and the actual money gets injected into this venture.

I'm certainly not trying to preempt the Committee's review of this process from a public policy perspective. I empathize with your struggle, in terms of the public policy issues. I assure you that this is an extremely difficult industry to analyze. It requires an attempt to anticipate governmental actions and other competitive and governmental responses which are basically and usually outside the purview of an analyst.

This is a very difficult industry to analyze, and it is similarly very difficult to develop public policy issues. But by definition, this is an extremely important industry. It has $40 billion of annual sales, of which the United States controls 75 percent of it.

I think that the industry within the United States has been extremely appropriate and aggressive in protecting this industry. I believe that we're going to be able to continue our U.S. dominance of this industry for many generations to come.

Thank you, Senator.

[The prepared statement of Mr. Modzelewski follows:]

PREPARED STATEMENT OF JACK MODZELEWSKI

Good morning, Mr. Chairman. I am Jack Modzelewski, a First Vice President and senior aerospace analyst for PaineWebber, a major brokerage and investment banking firm located in New York City. The comments I make here today are my own. Indeed, I bring you no specific advice on the public policy issues before this committee today; neither I, nor to my knowledge my firm, have any position on the proposed transaction. However, I should tell you that I have been advising clients that I expect the proposed joint venture between McDonnell Douglas and Taiwan Aerospace to be consummated. What I hope my testimony can offer the Committee is a glimpse of how a Wall Street analyst views the transaction.

Characteristics of the commercial aircraft industry

The commercial aircraft industry is obviously very important to the United States, and the McDonnell Douglas/Taiwan Aerospace proposed arrangement is a significant event, certainly for McDonnell Douglas and to a lesser extent for the global commercial aircraft industry.

Commercial aircraft are the most sophisticated non-military equipment built in the world, and the U.S. is the clear market leader.
The United States currently dominates the commercial aircraft world market. The industry's "Big 3" are Boeing and McDonnell Douglas, both U.S. companies, (with 75% of the world market) and the European consortium, Airbus. In 1991, we estimate commercial aircraft sales to be:

Table 1. Commercial Aircraft 1991 estimated revenues (in billions of dollars)

	Revenues	Market Share
Boeing	$22.9	57%
McDonnell Douglas	7.5	18
Airbus	8.6	21
Other	1.5	4
Total	$40.5	100%

Commercial aircraft deliveries, revenues and profitability have increased considerably over the past ten years (see Chart 1). This can distort the overall industry characteristics, which reveal an industry that is still very cyclical and very competitive.

Characteristics of the commercial aircraft industry (continued)

The commercial aircraft industry has very high "barriers-to-entry."
The commercial aircraft industry has its own economic protective elements that are labeled "barriers-to-entry." The industry requires very high investment, leading-edge technologies together with sophisticated production, marketing and support systems. If any of these elements are missing, a $10 billion investment can easily be lost. More specifically, these "barriers-to-entry" include:

- Very large development costs.
  The new Boeing 777 is estimated to cost over $4 billion to develop. In addition to the development costs, a similar amount is needed for investments in building, inventory and tooling. As in any other viable industry, new product developments are dependent on the profitability of the overall industry.

- Low unit volumes.
  The industry will ship 850 aircraft in 1991, a record year. (see Chart 1)

- Significant "learning curves".
  "Learning curves" essentially mean that each additional aircraft is produced in less time, and for less money, than the previous unit.

  The key implication of the above factors is that the number of units produced is the dominant cost factor in the production of commercial aircraft (particularly early in the productive cycle of an aircraft program). This is an important point for any discussion of "low cost" production in the commercial aircraft industry.

- Low "rates-of-return".
  Airbus has lost well in excess of $10 billion developing its product line. McDonnell Douglas has noted: "The facts are, from 1969 to 1989, we turned out 2,441 aircraft and lost more than $1 billion." Boeing (due to its significant investments and leading market share) has been the only profitable commercial aircraft manufacturer over the past 20 years.

- Excess capacity.
  Currently, the commercial aircraft industry is producing a record number of aircraft, but the industry has excess capacity. Aircraft deliveries have increased from 285 units in 1982 to an estimated 850 in 1991. And the industry continues to add capacity. At the present time, annual production capacity is approximately 1,000 aircraft per year:

Table 2. Current annual capacity in the commercial aircraft industry

	Number of Aircraft
Boeing	500
McDonnell Douglas	200
Airbus	200
Other	100
	1,000

Characteristics of the commercial aircraft industry (continued)

Based on projected air traffic passenger growth and replacement of aging aircraft, we estimate that over the next ten years only 6,000 aircraft will need to be built (or 600 aircraft per year). When compared to the 1,000 aircraft per year manufacturing capacity that already exists, significant excess capacity is apparent, which questions the economics of adding additional capacity. In addition, the 600 aircraft per year requirement, which we call "equilibrium demand," indicates that the current commercial aircraft industry production rates of nearly 900 aircraft per year are not sustainable. We have labeled the industry's projected downturn in aircraft deliveries beginning in the next several years as a "period of pain" (see Chart 2).

- Significant foreign investment can be motivated by more than an economic "rate-of-return."
The "high costs," "low unit volumes," "learning curves" and "low rates-of-return" that characterize commercial aircraft production suggest that any significant (government) investment might not be fully explained by economic reasons. Alternative reasons include technology advancement, national pride, employment and critical skills maintenance/development (some of which are potentially transferable for defense applications).

Illustrative is Airbus, which from the point of view of market share is a great success. It now has 30% of the industry's current backlog (see Table 3) versus 5% eight years ago:

Table 3. Commercial Aircraft Firm Backlog (as of September 30, 1991)

	Aircraft	Percent
Boeing	1,695	51
McDonnell Douglas	450	13
Airbus	985	30
Other	200	6
Total Backlog	3,330	100

At the Paris Air Show in June, Airbus discussed plans to launch a 600+ seat aircraft with development costs in excess of $5 billion. This is an important event to monitor, in that the economic "rate-of-return" of all investments into Airbus to date has been negative and yet continued new investments are being contemplated. In addition, Airbus is not the only European competition with expansion plans. Deutsche Aerospace has announced preliminary plans to launch a 100+ seat aircraft, and Fokker, a publicly held Dutch company, may soon receive government assistance to finance the development of both a 70 and 130 seat aircraft based on the F100 currently in service.

In the same way the U.S. did not ask about the "discounted rate-of-return" of the highway system we embarked on in the 1950s and 1960s, it appears other nations are willing to embark upon commercial aircraft ventures without "rate-of-return" requirements. This is not to suggest that economics are of no concern; obviously any significant investment into the commercial aircraft market is made with an assessment of the economic consequences associated with the probable industry/governmental competitive response.

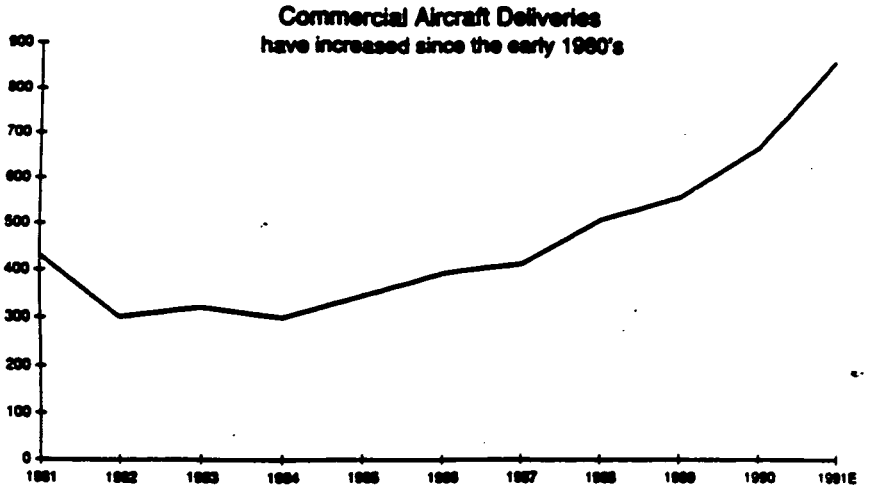
Commercial Aircraft Deliveries
have increased since the early 1980's
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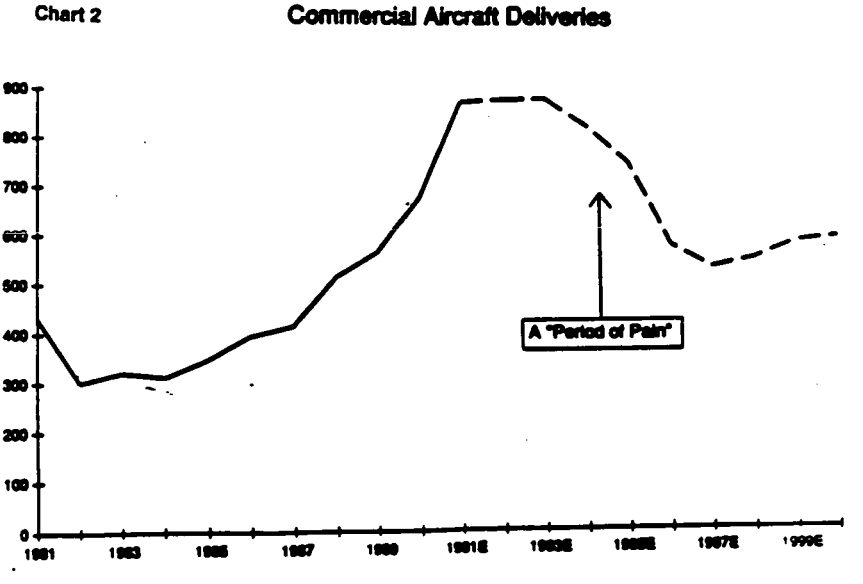
Chart 2


Commercial Aircraft Deliveries
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A "Period of Pain"
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McDonnell Douglas/Taiwanese joint venture

Background
McDonnell Douglas (MD) is the number one U.S. defense contractor, and the number three commercial aircraft producer. The uncertain future of U.S. defense spending and the extremely competitive commercial aircraft industry have put MD in a very difficult competitive position.

The enclosed stock chart of McDonnell Douglas demonstrates that the past 10 years have been a volatile time in MD's history, and its stock price reflects this volatility (see Chart 3). From 1981 to 1986, the defense buildup under the Reagan administration caused MD stock to triple from $30 to $90 a share. From 1986 to the beginning of 1989, MD stock has reacted to the crash of 1987 and the decline in the U.S. defense budget (both negatives), and the positive event of increasing commercial aircraft orders beginning in 1988. MD stock went into a significant slide from $90 a share beginning in February 1989 reaching a low of $26 a share in early 1991 in the wake of the A-12 cancellation. However, the stock is up dramatically in recent months with the speculation on potential "Pacific Rim" financing (see Chart 4). Indeed, we are reasonably confident McDonnell Douglas' stock price rise signals a positive reaction by MD shareholders and investors, generally, to the proposed venture. At the current $70 a share price, MD has returned 9% per year for the ten-year period, principally due to the 80% increase in 1991 year-to-date. (By comparison, the overall stock market, as measured by the Standard and Poor's 500 is up 215% during the same ten-year period, or 12% per year, and up 16% in 1991).

MD's volatile stock price performance is in contrast to Boeing stock, which has increased from $10 a share in 1981 to $45 today, a 350% return or 16% per year (see Charts 5 and 6). Boeing's superior return, with lower volatility, is the result of a corporate strategy of making significant investments in the commercial aircraft industry that continues today with the the 777 development. In 1991, Boeing's stock price is down 1% which appears to be principally in reaction to the increased competitive effect the proposed equity transaction could have on the commercial aircraft industry's profitability.

Joint Venture
It needs to be pointed out that the joint venture between McDonnell Douglas and Taiwan Aerospace has yet to be finalized, which limits the ability to fully analyze the proposed deal.

We understand that the joint venture consists of an estimated $2 billion investment by Taiwan Aerospace for 40% of Douglas Aircraft (the commercial part of McDonnell Douglas). In addition, there is the potential for MD to sell another 9+% to other "partners," and there is a strong possibility of the launch of new aircraft, such as the MD-12.

The stated reasons for the investment as I understand them are: lower labor costs, higher quality subcontracting, and access to the Pacific Rim airline market to sell aircraft. All of these are laudable goals if they can be fully achieved and would help make McDonnell Douglas more competitive globally. It is the goals themselves, however, and not the means used to achieve them (in this case an equity stake) that will make the deal successful for MD.

McDonnell Douglas/Taiwanese joint venture (continued)

The launch of the MD-12 and development of the MD-90 series, etc. offer Taiwan Aerospace possible opportunities to share the technology and the critical skills needed to develop, produce, market and service a viable commercial aircraft program. It is our understanding that critical technology, such as aircraft design (particularly wing technology) and avionics (including avionics integration), proprietary to Douglas will be kept there. However, successful aircraft programs rest not only on "technology", but high level design, integration and assembly skills as well.

One other economic consideration is that by adding capacity, the joint venture has the short-term benefit of creating jobs with the launch of the MD-12. However, the long-term economic issue is increased capacity (which in an industry of excess capacity is suboptimal use of capital) resulting in the lower profitability of the entire aircraft industry (which, though it will be felt globally, by definition weakens principally U.S. firms). Assuming the demand to justify them, the next generation of aircraft (e.g., Mach 2 or 3 civil aircraft) will require ever increasing amounts of capital for new design and manufacturing techniques. With the United States' current dominant position in the industry, and our high level of defense spending keeping us on the leading edge of aerospace technology, the U.S. should remain the only country to develop the next generation of commercial aircraft. Only the lack of sufficient risk capital can prevent this. But when all is said and done, if governments choose to add capacity and ignore return-on-investment, they can do so regardless of the availability of ventures like McDonnell Douglas/Taiwan Aerospace. The only potential differences will be time and the investment required.

Chart 3

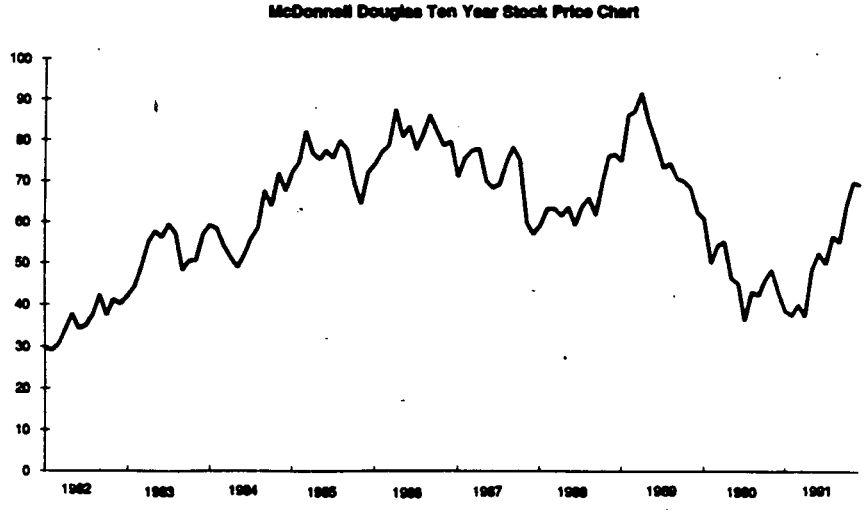


Chart 4

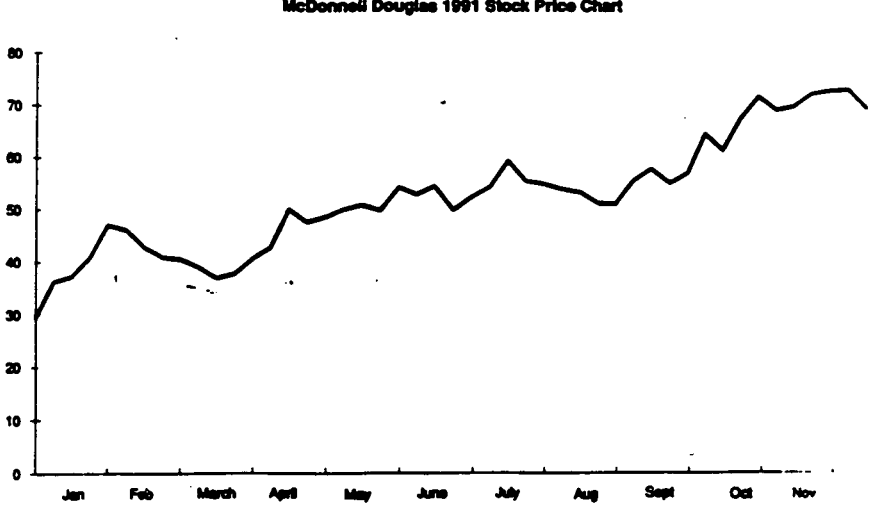


Chart 5

Boeing Ten Year Stock Price Chart

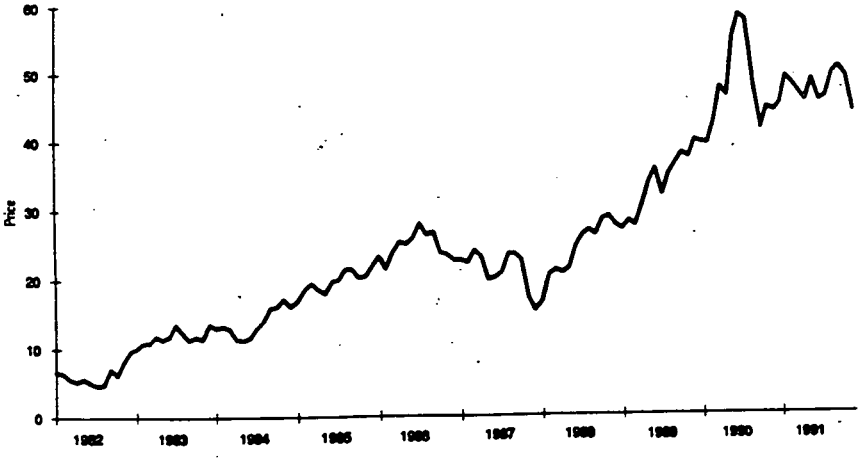
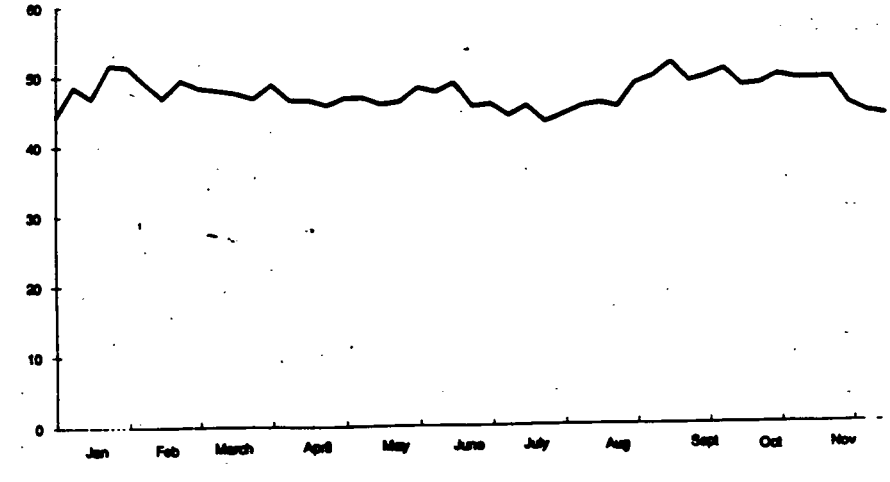


Chart 6

Boeing 1991 Stock Price Chart



"Wall Street" is neutral on the public policy debate

On Wall Street, an analyst's job is to anticipate events, determine the financial implications, and forecast the probable impact on the affected companies' stock prices. As such, we are generally neutral to any public policy issues, but extremely interested in the final decision which can impact stock prices.

I believe as an analyst that the proposed equity financing is rational economic behavior by McDonnell Douglas (as a firm) and is a logical attempt by the management and Board to protect the shareholders' and employees' interests and enhance shareholder value. It has been a successful strategy as evidenced by MD's recent stock price increase (see Chart 4). However, continuation of Wall Street's initial positive response to the proposed joint venture will likely depend on: a) any potential U.S. government action relative to this issue and b) prospects for future profitability of the venture specifically and MD generally. While I certainly cannot claim to speak for the diverse set of opinions we lump into the phrase "Wall Street", I would suggest investors are assessing the likelihood of five different scenarios and acting on those assessments:

- Disallowance of the Taiwanese investment. Should this alternative develop, McDonnell Douglas would continue to produce aircraft, but its long-term viability would be impacted because its ability to develop new aircraft would be significantly limited. We would not expect a launch of the MD-12. The stock price impact would be negative for McDonnell Douglas, but positive for Boeing. Disallowance does not appear to be the probable outcome in investors' eyes, and the stock market has been selling Boeing stock.

  "Boeing's stock price has been down recently as the stock market has correctly assessed that McDonnell Douglas' financing arrangement, by adding capacity and increasing competitiveness in the commercial aircraft market, is a negative to the overall fundamental profitability of the commercial aircraft industry." -PaineWebber report dated November 22, 1991.

- Allow any U.S. firm (e.g., Boeing) to invest in McDonnell Douglas without regard for antitrust implications. Under this scenario, antitrust, an obvious issue here, is seen as a less problematic public policy issue given the global, highly competitive state of the commercial aircraft industry.

- Extend tax credits. As mentioned earlier, it is very expensive and risky to develop new aircraft -- a fact which could possibly drive all new aircraft developments to offshore partnerships, particularly in search of risk capital. Extending additional research and development (R&D) tax credits to the aircraft producers would appear to be one natural U.S. government response under this scenario.

"Wall Street" is neutral on any public policy debate (continued)

- Develop a framework to monitor foreign equity financing into the industry. The issue here is not to stop or hinder the flow of international capital, but "monitor" the transfer of critical technology and the associated industrial base.

- No governmental review or oversight of this financing. Obviously, the impact of no government intervention would be positive on McDonnell Douglas' stock price:

  "McDonnell Douglas should continue to trade up as the financing arrangement is finalized. Longer term, McDonnell Douglas will remain in third position in commercial aircraft (Boeing and Airbus being number one and two), but it is now a viable long-term competitor. However, the ability of the third placed competitor to "prosper" remains uncertain." -PaineWebber report dated November 22, 1991.

  The reaction of McDonnell Douglas' and Boeing's stocks thus far suggests this is the outcome expected by most investors.

Conclusion - A Wall Street Perspective

A commercial aircraft is the most complicated (non-defense) piece of equipment built, and the U.S. currently has earned over 75% of the world market.

Security analysts are "agnostic" towards the final public policy position. This is a very complicated public policy issue, centering around potential implications of possible technology transfers, the maintenance of MD as a viable third producer of commercial aircraft and the sustainability of public and private competitors coexisting in the commercial aircraft market. Nevertheless, investors are extremely interested in the ultimate public policy position taken, in that any position could have a material impact on the price of McDonnell Douglas' stock, and to a lesser extent Boeing stock. (Boeing has over $16 billion of stock which is actively traded, while McDonnell Douglas stock value is approximately $3 billion).

Industry has unique characteristics that tend to preserve U.S. dominance (especially to the extent that market forces dominate the industry's activities). The commercial aircraft industry has very high "barriers-to-entry" (large development costs, low unit volumes, significant learning curves and, at the present time, excess capacity), which makes it extremely difficult for any firm(s)/country(ies) to enter the market.
The combination of high technology and complex integration has played to strengths in the U.S. and allowed us to continue market leadership even in the face of governmental "subsidies" to Airbus, and limit the potential need for U.S. government intervention in this venture.

McDonnell Douglas' actions represent rational economic behavior, and appears in the shareholders' interest.
MD's stock has increased significantly in 1991 (up 80% versus the overall market increase of 16%), and a significant portion of the increase is attributable to the prospect of the Taiwanese equity infusion. Given MD's market position relative to Boeing (the market leader with an excellent balance sheet), and Airbus (which has developed a full product line and captured over 30% of existing orders); MD has correctly determined that the long-term viability of their commercial aircraft division required additional financing in order to develop new products. Another positive would develop (particularly in the short term) if the MD-12 is launched with the addition of a significant number of jobs within the United States.

Conclusion - A Wall Street Perspective (continued)

Economic returns appear low, but not nonexistent.
At issue here is whether non-return-on-investment reasons (e.g. technology transfers, employment, development/maintenance of critical skills, some of which are transferable to defense applications, etc.) are driving the current Taiwanese equity infusion. While the potential economic returns appear low, they are neither so low, nor so improbable, that alternative motivations are necessarily driving the venture.

The equity infusion could generate various competitive and government responses.
Boeing will remain the market leader in the commercial aircraft market (with Airbus number two) even after the equity infusion, but a clearly viable McDonnell Douglas is likely to keep the industry extremely competitive. However, the venture may produce another offsetting force. Additional new entrants, such as Fokker, Deutsche Aerospace or others, may not be willing to enter a market with three clearly viable participants. Ironically, given the current excess capacity in the industry, the Taiwanese equity infusion would be a positive for industry profitability if additional new entrants do not materialize.

The offsetting potential negative is that the "success" of this venture in the future could reduce overall industry profits, particularly for the industry leader, Boeing. The stock market remains extremely interested in this possibility, but the recent stock price reduction in Boeing (in the 10% area) indicates that no material, adverse consensus has developed regarding this transaction.

Regarding the potential U.S. government responses, it appears the equity infusion is structured to avoid any transfer of U.S. military technologies which could raise "national security" objections. In addition, no clear public policy alternatives are readily apparent, or particularly appropriate. As such, we have advised our clients that U.S. public policy issues are unlikely to block this transaction. We are not trying to pre-empt this Committee's review process -- you are wrestling with some very difficult public policy issues in an industry that does not lend itself to easy management actions, investment analysis, or public policy decisions.

SENATOR BINGAMAN. Thank you very much.

Let me first focus attention back on the issue of the subtiers on subcontractors. I think, Ms. Evans, you and Mr. Mowery, maybe you also, Mr. Ray, indicated that that is a problem area, as you see it.

I guess my question is, what should be done, if anything, if there's an appropriate government response to that problem?

Mr. Mowery, you referred in your comments to the web of infrastructure and capabilities that undergirds our aerospace industry.

Are we looking at the beginning of the loss of that, or are we well into the loss of that? Or am I too alarmist to think that we might ever lose that?

MR. MOWERY. Well, Mr. Chairman, I think much of that infrastructure to which I referred has been supported with both public as well as private funds in the form of research installations, underwritten by both the Department of Defense and the NASA aeronautics.

But I think, certainly, that we should not be naive and think that this sector cannot be eroded and is invulnerable to foreign competitive pressure, particularly when we have the simultaneous effects of both declining defense procurement and this increasing internationalization of the prime contractor tier, which is having the effect of bringing more competitors into the supplier segment.

At the same time that one should be concerned about this, I think we need to keep two things in mind.

First, we really do not have a good analytical definition of the aerospace industry or of the defense industrial base. Nor do we necessarily have, in the economic sense, a very good analytic handle on its health.

There have been conflicting studies and very little statistical information on this.

Second, this tier is experiencing rapid growth in exports, in part, because of the expanding international web of agreements that certainly involve Airbus sourcing components from the United States, even as Boeing, General Electric and Pratt & Whitney source components offshore.

So, I think that this is an area that merits close scrutiny. I think that it's an area in which more analysis and data collection need to be done. I think that it's an area that has been historically underserved by existing federal programs that have benefited the aerospace industry.

But I would be reluctant to say that we are in a crisis at the present time without more information.

SENATOR BINGAMAN. Ms. Evans, did you have any additional thoughts as to what could be done if we have a real problem here with the effect of this transaction on subtiers?

MS. EVANS. As I suggested in my testimony, I think the research and development aspect of this industry has to be reinforced.

Again, the firms that I've been in contact with, both within the United States and particularly in the St. Louis region, which are important

suppliers to McDonnell Douglas, are suggesting a much more overt, commercially-based program that addresses strategic technologies.

One other factor that has been missing is that a number of firms have suggested that, in fact, their prime contractors, such as McDonnell Douglas or Boeing, are actually some of their best U.S. export representatives. The prime contractors are in fact helping their subtier suppliers get into the export markets abroad.

This would be something again to encourage.

SENATOR BINGAMAN. There's a statement that Fred Bergsten, who is director for the Institute for International Economics here in town, made at a hearing a couple of weeks ago, where he said that this country's foreign investment and trade laws, of course, cannot solve our problems. The need is for a much more comprehensive technology policy through which our government can work with other American companies to fashion firm-specific packages, including governmental supports as necessary to keep critical technologies under domestic control.

Is that something that you folks would agree with? Anybody disagree with that?

He is noted, I guess, in economic circles for being a strong advocate of free trade, and yet, seems to feel that we need a much more pro-active governmental effort to shore up our own industries involved in some of these areas.

Is that something that you all can agree with? Mr. Ray, do you agree with that?

MR. RAY. What I think about in hearing some of the remarks about the alternatives through the first panel is that everybody loves a subsidy. So, I could believe that subtier producers would like to have R&D support from government subsidy programs.

But I think it would be worthwhile to think about, in a broader sense, are there technologies that do have sufficient external spill-over effects that warrant some kind of collective action?

But I think the case ought to be advanced first, and I'm not sure the case can be advanced most effectively with respect to the aerospace industry, as opposed to computers, or electronics, or some other part of the economy. That's the difficulty.

But everybody loves a subsidy.

SENATOR BINGAMAN. Any of the rest of you have a comment on that?

MR. MOWERY. I think that part of the motivation for Dr. Bergsten's comment, and it's one with which I agree, is that we have spent much of the last 10 or 15 years trying to use trade policy to substitute for the absence of a technology policy on the civil side, where we, in effect, are forced to resort to various negotiations or threats of restrictions on market access and the like to, in some sense, recover from the effects of the lack of a technology policy.

I think that an appropriately designed technology policy is a legitimate concern. We have always had a technology policy, or I should say that we've had a technology policy in this economy for roughly 150 or,

perhaps, 170 years. So, I think that it defies belief to argue that, in some sense, the Federal government has been neutral with respect to different industries and technologies and to their support and promotion.

I think that the questions are to try to develop a technology policy, in ways that encourages the efficient commercial exploitation and adoption of technologies, and in ways that do not produce additional subsidy wars between the U.S. and foreign governments, of the sort that we certainly run the risk of creating, I think, with some recent discussions.

SENATOR BINGAMAN. Mr. Modzelewski, you describe how the United States depends on profits versus foreign industry, which does not depend on profits to make additional investment. And you also made the obvious point that in order to have profits in this industry that you need to have market share.

It would seem, given the fact that U.S. producers are up against heavily subsidized foreign producers who do not depend upon profit over a reasonable period of time, our market share is inevitably going to decline, and foreign market share is inevitably going to increase.

Am I missing something in that equation?

MR. MODZELEWSKI. I don't disagree with your analysis at all, Mr. Chairman.

The issue here, whether we're dealing with subtiers, or whether we're dealing with the primes, etc., is that we have a few different cross-currents, and a lot of them are negative to the industry.

The first one is that defense spending is coming down worldwide. And because we have the largest defense budget, our defense spending is going to come down the most, and there will be the trickle-through theory, so you can be assured that the subtier companies within the U.S. base are going to be affected and affected dramatically. Their ability to offset it vis-a-vis exports, etc., will be minimal.

And, in fact, you've made a very good point, and that is, if the other industries, and you can presume that if subsidies are potential and have been at work in terms of the commercial aircraft industry, the defense base of other foreign companies will also be in a position to get a subsidy, which will again put the U.S. prime and subcontractor base at risk.

The issue here is that I think that we first have to, at least, accept that and understand it.

In terms of whether there is an appropriate governmental public policy that can address this, I think that's step two. But I certainly don't disagree with your analysis. This is the effect. This is going to be the continuing effect. How we choose to address it, I assure you that we are very interested in it on Wall Street.

SENATOR BINGAMAN. You made a statement, or at least one was attributed to you in the *Los Angeles Times*, where you said that this McDonnell Douglas deal with Taiwan Aerospace amounted to sewing the seeds of destruction for the U.S. aerospace industry.

Is that an accurate quotation? And if so, is there some description or articulation of that that you'd like to make?

MR. MODZELEWSKI. Mr. Chairman, I can't seem to remember the exact quote, but I am very vehement in terms of being very careful with investments into the U.S. commercial aircraft industry. I do not believe that there is necessarily ulterior motives, by definition, and I think that, believe me, as an investor, trying to see whether or not there's going to be a fair rate of return that's going to develop out of this joint venture, by definition, requires one to examine the motivation of the investment coming into it.

I think, without getting too subtle, it's important to do this analysis and to make sure that the investments are strictly for economic rates of return. That has not necessarily been the case in the bulk of the foreign investments in the commercial aircraft area that I have been aware of over the past several decades.

It is in that arena that one has to be very careful. As I said in my remarks, I do not find that on the surface that the rates of return on this venture necessarily push it in that direction.

But one has to be very careful in terms of what type of investment is being made. And the biggest risk that I see in this is not as the proposal is currently set up, i.e., a subcontractor that is willing to just make an equity investment and, therefore, be able to provide low-cost labor and certain subcomponents to the commercial aircraft.

What is attendant to this, or which will be the next possible step, is going to be the launch of new aircraft. It will be at a new site. Remember, making aircraft is not just technology. It's not just capital. It's a confluence of various systems at work; it's marketing; it's support; it's a subcontractor base; it is systems analysis; it's flight testing, etc.

There is a tremendous number of elements to this—each one is critical to the production of a successful commercial aircraft program.

We have to be very careful when we launch new aircraft. This will be developed in a new sense. There will be an entirely new "greenfield" operation. It is here in that development where the potential would exist, the critical elements that we in America seem to have the dominant position in; we could compromise those.

And that's basically the statement that I made to the *L.A. Times.* It was in a broader context that one has to be careful that this type of investment does not engender the seeds of which I think could be a weakening of an industry, of which we have preeminence in, and of which I think we've earned.

We've made dramatic investments. I think that Boeing and, I think, McDonnell Douglas also, relative to the market share that they have, have made Herculean efforts to keep what market share they have relative to the competitive subsidized pressures against them.

SENATOR BINGAMAN. Yes?

MR. MOWERY. I just want to make a very short comment on your point about the foreign subsidies.

I think, while your point is correct, if Boeing and General Electric and Pratt & Whitney were in some sense going it alone against these foreign beneficiaries with subsidies, we do have to keep in mind that precisely one of the motives for these teaming arrangements is the ability to get on both sides of the subsidy, in some sense.

That is to say, Boeing benefits to a certain extent by tapping low-cost capital through its Japanese risk-sharing subcontractors and partners in its 767 and 777 ventures. GE benefits by tapping either loans or some direct grants extended to SNECMA through its joint venture with SNECMA on the engine side. And Pratt & Whitney similarly benefits.

So, on the one hand, the subsidies are an important incentive for U.S. firms to team with offshore partners. On the other hand, having teamed, they are in the near-term, at least, benefiting from the willingness of foreign governments to extend some support to their domestic firms.

SENATOR BINGAMAN. Before you arrived, Mr. Prestowitz made somewhat the same point in that he said that one of the reasons Boeing had made its arrangement with the Japanese in the development of the 777 was in order to take advantage of a subsidy by the Japanese government, and that that is, in his view, a fairly clear motivation for this transaction, as well.

Do you agree with that conclusion or not?

MR. MOWERY. I would agree with that conclusion. I think that the low economic return that Mr. Modzelewski has hypothesized certainly is lower than the cost of those funds to McDonnell Douglas on the U.S. capital market, in some sense.

McDonnell Douglas would have to pay a great deal more for those funds than the low return that Taiwan Aerospace is willing to settle for.

So, yes, I think these subsidies do——

SENATOR BINGAMAN. So, is it fair to say, since we do not have a program for subsidy of the industry, we have both of the major aircraft companies going to team with foreign governments that are willing to engage in that subsidy in order to remain competitive with Airbus?

MR. MOWERY. Well, I think that the foreign subsidies are an attraction to U.S. firms in teaming. They are not the sole attraction, but they are an attraction. There's no question of that.

MR. RAY. But, Senator, it also gets back to that earlier point, that it's worth pressing the case on Airbus at GATT and elsewhere.

We ought not to accept that as a fait accompli, that there isn't some sort of working out of that difficulty that ought to be pursued.

SENATOR BINGAMAN. It may not be a fait accompli, but it's a longstanding fait. I mean, it's been there how many years now that we've allowed the sale of Airbus into this market, or the subsidy to continue. I guess the sales have increased very dramatically in the last few years.

MS. EVANS. Mr. Chairman?

SENATOR BINGAMAN. Yes.

MS. EVANS. I think there's another point that you might want to keep in mind, and that is the discussion about the 10 percent equity participa-

tion, perhaps, by South Korean and the Singaporean and, perhaps, Indonesian firms.

It's also useful to remember that these countries have rapidly developing aerospace industries themselves in which U.S. companies are already participating. They're there for offshore production. They're also there for maintenance facilities, etc.

These are also potential players along with the Taiwanese.

So, this is part of a much broader phenomenon where we're seeing huge amounts of government assistance throughout East Asia.

MR. MOWERY. Moreover, to the extent that these other players do come into this venture, you're then dealing with a consortium that controls or that involves a fairly substantial market for these aircraft, and a market that's growing very rapidly.

So, the market access motive becomes a more important attraction for McDonnell Douglas, I would argue, in entering into this venture, because they can improve their access to a market that's growing far more rapidly than the domestic U.S. market for these aircraft.

SENATOR BINGAMAN. Well, it seems to me that, and maybe I'm pushing this argument further than it needs to go, you're describing a situation where more and more foreign governments are willing to subsidize or invest heavily in the aerospace industry in order to have a presence in that industry, not necessarily for economic reasons.

The effect of that very heavy investment and subsidy by foreign governments is to put our own for-profit firms at a very substantial disadvantage and in a situation where their only option may be to go overseas to take advantage of those subsidies.

MR. RAY. Well, but it does go back to this issue that was raised before. And that is, what is the nature of the particular joint venture? Is it one that essentially is going to allow them to substitute for our ability to supply their and other regional markets, or is it a partnership that, in fact, makes it possible for us to deal, at least for the present, with the fact that we have things like Airbus with substantial government subsidies that are working at a very strong advantage relative to our domestic manufacturers.

And with respect to the subtier producers, the short-term issue is that the foreign direct investment is likely to expand their operation because they're going to be the primary sources that Douglas and Taiwan are going to be able to identify for supplies of quality parts that they need. And for the longer term, if they do, in fact, maintain a market presence in these expanding Asian markets, it could benefit those subtier producers as well.

The issue is what forms do those joint ventures take over time? And it may be, in this particular case, there is no reason to be terribly concerned, but it may be in the next case, there is a lot of reason to be concerned.

So, it's certainly appropriate in any instance of this sort to look at the particulars and say, what's going on here? What are the long-term versus

short-term consequences for this particular producer and for U.S. manufacturers who are part of a broader base that supplies that industry?

SENATOR BINGAMAN. I appreciate your presence and your testimony very much. I think that it's been very useful, and particularly those of you who had to come from out of town, thank you very much for coming all this distance.

Our final panel will be the chairman of Douglas Aircraft Company in Long Beach, California, Mr. Robert Hood.

We would like to ask him to come forward. Mr. Hood, welcome. Thank you for coming to testify. We look forward to hearing your statement.

STATEMENT OF ROBERT H. HOOD, JR., PRESIDENT
DOUGLAS AIRCRAFT COMPANY
ACCOMPANIED BY: THOMAS CULLIGAN, VICE PRESIDENT, PROGRAM DEVELOPMENT AND MARKETING

MR. HOOD. Thank you, Mr. Chairman. It's good to see you again.

Before I start, I'd like to introduce Mr. Tom Culligan, a colleague of mine who is Vice President of Program Development and Marketing for McDonnell Douglas Corporation.

I sincerely appreciate the opportunity to appear before you today and address the actions that McDonnell Douglas has underway to strengthen its ability to compete in the global civil-aircraft market.

The commercial aircraft industry today is undoubtedly one of the most competitive and capital- and resource-intensive industries in the world. McDonnell Douglas intends to be, once again, the preeminent designer and builder of commercial aircraft.

In order to gain market share, McDonnell Douglas must develop new competitive products. Currently, we compete in only two out of six market segments with our MD-80 twin jet and our MD-11 tri-jet.

We need to broaden our product line, and the aircraft which McDonnell Douglas needs to solidify itself in the market place is its companion to the MD-11, the MD-12.

The high development costs required to design and build the MD-12, approximately $4 billion, are more than our company can afford. We concluded that we have two choices: increase resources and dramatically reduce the cost structure, or don't build the MD-12.

We found a partner in the Republic of China and through Taiwan Aerospace entities within the Republic of China. They wish to enter the commercial aircraft industry and they have the technical capacity and financial resources to do so.

The result is a strategic alliance which will enable McDonnell Douglas to proceed with the MD-12.

Taiwan Aerospace is a group of Republic of China business interests, formed earlier this year to be both a prime contractor and a subcontractor in the aerospace industry. Several major Republic of China companies have provided the start-up capital for the venture. Additional funding has

come from government-backed institutions. The venture is structured around a sound, solid business basis.

The alliance makes available to McDonnell Douglas capital, low-cost production, and gives it a stronger position in the critical Asian market, the fastest growing region in air traffic.

Significant parts of fabrication and major subassembly work will be done in Taiwan, with final assembly at a new facility in the United States.

The Memorandum of Understanding provides for the formation of a new aerospace company which will be jointly owned by McDonnell Douglas and investors in the Republic of China. Under the Memorandum of Understanding, the Republic of China investors could acquire a 40 percent interest for $2 billion in what is now McDonnell Douglas' commercial transport business.

McDonnell Douglas will retain the majority interest and management control of the new company. The terms of the Memorandum of Understanding call for a definitive agreement to be concluded during the first quarter of 1992.

I would like now to address the subject of technology transfer.

First, none of the McDonnell Douglas military transport technologies are part of this agreement. The corporation has already begun to make a clean separation of its military and commercial businesses.

It would not be in McDonnell Douglas' or the nation's interest to share its military technologies with either a foreign government or a U.S. competitor. We are confident that we will not compromise our technologies in any way.

Second, by maintaining majority ownership of this new international company, McDonnell Douglas will maintain control over critical design and systems integration, final assembly, product support, customer integration and flight tests.

The Republic of China strengths will come from the capitalization of basic manufacturing, fabrication and subassembly, which does not position them singly to build a finished product that would compete in the airline market.

Given that most industrialized nations in the world are already accomplishing the type of work that Taiwan will undertake, there is no technology transfer. Both parties benefit from McDonnell Douglas' established marketing and product-support network.

Once a final agreement for this alliance is reached, the Republic of China is unlikely to ever become a competitor. As a partial owner of the new company, their viability will lie in making the enterprise successful. There would be very little motivation for them to build a parallel, a competing industry that would hurt their own market share.

Since the new company will have its own facilities and work force in the Republic of China, it would be difficult for a competitor to emerge. With or without U.S. assistance, wealthy industrialized nations will attempt to develop their own aerospace industries.

If a foreign entity builds one on their own, or with the assistance of another nation, the United States has absolutely no control over the technology developed and could end up fighting off a competitor.

By building a strong and dynamic aerospace alliance, McDonnell Douglas may be in a position to prevent other countries from entering the market.

Our new company is the way for McDonnell Douglas to maintain leadership in the aerospace industry. The investment by entities in the Republic of China and in any other potential partners gives the new company the strength to invest more resources in research and development which will benefit American industry. The new company is, and will remain, a U.S. company.

The Memorandum of Understanding signed by McDonnell Douglas and Taiwan Aerospace Corporation can lead to a dynamic new era for the United States' oldest commercial aircraft builder. Rather than losing 40 percent of an icon of the American aerospace industry, McDonnell Douglas will be gaining majority ownership in the newest and potentially the most promising aerospace company in the world.

I thank you for the opportunity, Mr. Chairman, to appear before you today, and I would be happy to answer any questions.

[The prepared statement of Mr. Hood follows:]

PREPARED STATEMENT OF ROBERT H. HOOD, JR.

Mr. Chairman, thank you for the opportunity to appear before you today and address the actions McDonnell Douglas has underway to strengthen its ability to compete in the global civil aircraft market.

The commercial aircraft industry today is undoubtedly one of the most competitive, capital, and resource intensive industries in the world. Profitability is often elusive as every time a new aircraft is launched, the development costs associated with that aircraft could exceed the net worth of the company building it. In a sense, every time a new aircraft is built, the company bets its future on it.

McDonnell Douglas intends to be, once again, the preeminent designer and builder of commercial aircraft. The long heritage of Douglas Aircraft is world renowned, but in the last two decades the competitive climate has changed. While Lockheed, an established and well regarded manufacturer left the commercial aircraft business, a new government subsidized competitor, the European Airbus, was born. McDonnell Douglas has seen its market share dwindle from

being number two to number three at the expense of Airbus.

Just in the last few years, we have witnessed unprecedented changes in the world order, changes that could only be dreamt of previously. Who could have foreseen the events we have witnessed: in Eastern Europe and the Soviet Union; the transformation of Europe into a single economic entity through the EC92 process; and the possibility of a North American Free Trade Agreement. So too, has aerospace become an international partnership, bringing together the strengths of many companies worldwide.

The world is getting smaller, yet our horizons seem to be endless. America still designs and assembles the majority of the world's airliners, but does not have an exclusive lock on large-airframe technology. The European consortium, Airbus, formed in 1968, builds some of the market's most technologically advanced airliners. With the help of generous governments subsidies, they have captured more than 25% of the airliner market over the last two years. On a smaller scale, but nonetheless impressive, are the growing commercial aircraft industries in Brazil, The Netherlands, Romania, Sweden, Indonesia, Israel, and the Soviet Union.

Numerous joint ventures or global alliances have already been formed throughout the aviation industry. The

internationalization of the larger aerospace companies began long before today.

For years, U.S. airframe manufacturers sought out sources for parts and subassemblies, and markets for finished products. McDonnell Douglas began building commercial aircraft wings in Canada over 25 years ago. Today, 16% of the MD-80 and 20% of the MD-11 are produced by foreign entities. The offshore content of Boeing airliners are similar, but the proportion will rise dramatically as Boeing offers its 777 technology to Japanese subcontractors. New international alliances are emerging at a rapid rate. It has recently been reported that Airbus is discussing the possibility of placing work with the same Japanese partners Boeing is using on the 777. United Technologies and Daimler-Benz of Germany invest in each other's aircraft engine divisions and operate as a single company for certain joint ventures. Commercial Fan Moteur (CFM) International is a 50-50 partnership between General Electric's jet engine subsidiary and the French company Snecma. CFM makes engines used to power Douglas, Boeing and Airbus Aircraft.

The aerospace industry has fundamentally changed, as has the world. The reduced military threat in the world, resulting in deep cuts in defense spending and intense competition among producers of commercial aircraft, has brought to the

forefront a fundamental issue for McDonnell Douglas. If McDonnell Douglas is to continue to grow, the commercial aircraft business must provide a greater portion of the revenues and profits.

In order to gain market share, McDonnell Douglas must develop new competitive products. Currently we compete in only two out of six market segments with our MD-80 twin jet and our MD-11 trijet. We need to broaden our product line and the aircraft which McDonnell Douglas needs to solidify itself in the market is the follow-on to the MD-11, the MD-12. The MD-12 is an 8,000 nautical mile, 375 passenger aircraft. It will, for the first time, challenge the monopoly position of the 747. The high development costs required to design and build the MD-12 (approx. $4B) are more than our company can afford. We concluded, we had two choices, that risk sharing, low cost partners are required to share in the aircraft's development, or, don't build the MD-12.

McDonnell Douglas surveyed potential partners throughout the United States and the world. What we found was that the amount of capital required for the project, and the weakened financial position of a great many companies, was beyond their abilities. In a sense, their situation was much like our own. Late last winter, we held conversations with

Taiwan Aerospace Company, then a newly formed entity within Taiwan's small but growing aerospace industry. What evolved is the reason why I sit before you today. Taiwan has available, sizable reserves of cash to be invested in key industries. We found in Taiwan a partner that wishes to enter the commercial aircraft industry, and has the technical capacity and financial resources to do so. The result is a strategic alliance which will enable McDonnell Douglas to proceed with the MD-12.

The alliance makes available to McDonnell Douglas: capital, low cost production rates, and access into the critical Asian market, the fastest growing region in air traffic. The new company will build state-of-the-art commercial aircraft in a cost-efficient way, enabling us to effectively compete world-wide. The combined resources of the U.S. and Taiwan entities will give the new company globally competitive production capability, financial strength, and a major presence in Asia. Significant parts of fabrication and major sub-assembly work will be done in Taiwan, with final assembly at a new facility, yet to be determined in the U.S. Soon after a final agreement is reached, we will select a U.S. site and start construction of this major final assembly facility for the MD-12. Currently, there are nine potential sites under consideration. They are Shreveport, La; Mobile, Al; Mesa, Az; Salt Lake City, Ut;

Ft. Worth, Tx; Kansas City, Mo; Tulsa, Ok; Belleville, Il., and Houston, Tx. Depending on the production rate, thousands of engineering and support jobs will be created throughout the U.S.

The Memorandum of Understanding signed on November 19 with Taiwan Aerospace Corporation outlines a mutually beneficial relationship involving only McDonnell Douglas' commercial aircraft business. The Memorandum of Understanding was signed only after the parties agreed that discussions had progressed to the point at which it was appropriate to enter into detailed negotiations for a definitive agreement on a long-term relationship. The Memorandum of Understanding provides for the formation of a new aerospace company which will be jointly owned by McDonnell Douglas and investors in the Republic of China. Under the Memorandum of Understanding, the Republic of China investors could acquire a 40% interest for $2 billion in what is now McDonnell Douglas' commercial transport business. McDonnell Douglas will retain the majority interest and management control of the new company. The terms of the Memorandum of Understanding call for a definitive agreement to be concluded by January 31, 1992.

Taiwan Aerospace is a group of Republic of China business interests formed earlier this year to be both a prime

contractor and a subcontractor in the aerospace industry. Several major Republic of China companies have provided the start-up capital for the venture. Additional funding has come from government backed institutions. The venture is structured around a solid business basis. The Republic of China investors, including the Republic of China Government, will carefully review financial, product development, marketing, and other information related to McDonnell Douglas' commercial transport business; and any resulting investment will reflect a thorough assessment of the market value of the share to be received. Unlike Airbus, the new company will be a commercial venture. It will be expected and required to maintain existing commercial aircraft programs and launch any new programs without government handouts. McDonnell Douglas and the Taiwan investors expect the new company to generate revenues that exceed costs, and to compete successfully in the international marketplace through innovative technology, low-cost production, and superior marketing.

I would now like to address the subject of technology transfer. First, none of McDonnell Douglas' military transport technologies are part of this agreement. The corporation has already begun to make a clean separation of its military and commercial businesses. It would not be in McDonnell Douglas' or the nation's interest to share its

military technologies with either a foreign or a U.S. competitor. We are confident we will not compromise our technologies in any way. Second, by maintaining majority ownership of this new international company, McDonnell Douglas will maintain control over critical design and systems integration, final assembly, and flight test. Taiwan's strengths will come from the capitalization of basic manufacturing, fabrication, and subassembly which does not position them to singly build a finished product that would compete in the airliner market. Given that most industrialized nations in the world are already accomplishing the type of work that Taiwan will undertake, there is no technology transfer. Both parties benefit from McDonnell Douglas' established marketing and product support network.

Once a final agreement for this alliance is reached, Taiwan is unlikely to ever become a competitor. As a partial owner of the new company, their viability will lie in making the enterprise successful. There would be very little motivation for them to build a parallel, competing industry that would hurt their own market share. Since the new company will have its own facilities and workforce in Taiwan, it would be difficult for a competitor to emerge. With or without U.S. assistance, wealthy industrialized nations will attempt to develop their own aerospace

industries. If a foreign entity builds one on their own, or with the assistance of another nation, the U.S. has absolutely no control over the technology developed and could end up fighting off a competitor. By building a strong and dynamic aerospace alliance, McDonnell Douglas may be in a position to prevent other countries from entering the market.

Our new company is the way for McDonnell Douglas to maintain leadership in the aerospace industry. The investment by Taiwan Aerospace, and any other potential partners, gives the new company the strength to invest more resources in research and development which will benefit American industry. The new company is, and will remain, a U.S. company.

The Memorandum of Understanding signed by McDonnell Douglas and the Taiwan Aerospace Corporation can lead to a dynamic new era for the United States' oldest commercial airline builder. Rather than losing 40% of an icon of American aerospace, McDonnell Douglas will be gaining majority ownership in the newest and potentially the most promising aerospace company in the world. Unencumbered by debt and outdated facilities, the McDonnell Douglas/Taiwan Aerospace alliance will be able to produce the lowest cost, highest quality airliners in the world. For the first time in

several decades, an American aerospace company will be able to begin development of a new airliner virtually debt-free. Moreover, the manufacturing and final assembly of the new plane will take place in newly built facilities optimized for commercial airliner construction. No other aerospace company or consortium in the world will have those advantages.

I thank you for the opportunity to appear before you today. I would be happy to answer questions.

SENATOR BINGAMAN. Well, thank you again for appearing here.

According to the information that I've been given, Mr. McDonnell asked the Secretary of Defense earlier this year to see if arrangements could be made for a billion dollars in special financing to help McDonnell Douglas through some of its financial difficulties.

If Secretary Cheney had granted that request, do you believe the company would still be entering into this arrangement with Taiwan?

MR. HOOD. Absolutely, Mr. Chairman. There are three things that we're trying to accomplish here.

First of all, we do need an infusion of capital. And we need that infusion of capital in order to develop new product lines. You heard me say in my testimony that there are six market segments, and, today, we only compete in two of those. So, it's necessary for us to have significant capital.

And second, we've been in this business for a long time, and in the last 25 years, we've not made any money in it, as I think Mr. Modzelewski pointed out earlier. So, we have to do something differently. And that strategy is a high-quality, low-cost strategy; and we are looking around the world to see who can help us achieve that goal.

And third, we need to have a stronger presence in what I've pointed out to be the strongest and most rapidly growing market in the world for commercial aircraft, and that's the Asian market.

SENATOR BINGAMAN. You've indicated that these three things—capital, market access, and low-cost suppliers—are the three things that you're hoping to get out of this arrangement.

My question would be, do you think it's essential that all three of those come from the same source? For example, if there were U.S. capital available, would it still be possible for McDonnell Douglas to obtain the other two—that is, the market access and the low-cost suppliers—through some kind of nonequity relationship with Taiwan Aerospace, which would lessen perhaps the concern about Taiwan investors demanding technology transfer?

MR. HOOD. Let's see, Mr. Chairman. I fail to see the incentive, then, for these foreign investors to do that. What you have to remember is that the Republic of China has a strategic plan. And part of their strategic plan is to aggressively enter the aerospace business, particularly the commercial business.

This gives them the opportunity to do that by buying an equity position. So, I just fail to see what their incentive would be to take on that risk if they weren't an equity partner.

SENATOR BINGAMAN. I guess my concern, which I think has probably come through on some of the questions, is that it's clear to me that Taiwan does have a strategic plan to get into the aerospace business. I'm not sure that we have a strategic plan to stay in it.

MR. HOOD. Well, let's see. I think, by doing this, Mr. Chairman, we do have a strategic plan to stay in it. I think that this is the only way that we will stay in it.

Again, I want to remind you that we do have control of this. This is a U.S. company, and we will be controlling not only the technology, but the future destiny of our aerospace partners in the Republic of China by having them as a partner and being able to manage them as a partner.

SENATOR BINGAMAN. There was a statement in the *Los Angeles Times* that quoted Michael Birch with McDonnell Douglas as saying, and I quote:

> A $2 billion investment for 40 percent of the commercial aircraft programs at Douglas is just the down payment for what is expected to be substantial additional investments.

Could you explain what's meant by that?

MR. HOOD. Certainly, sir. The $2 billion is the equity position. We would expect the Republic of China to fund any other additional development costs, plus the greenfield operations in China, with their own resources.

MR. CULLIGAN. If I may, that is also to say, Senator, that after the MD-12 that we have to continue to upgrade our product line, and we'll be doing that with follow-on products.

And so, as part of this new company, there will be further investment.

SENATOR BINGAMAN. Further investment in the development of those follow-on products.

MR. CULLIGAN. That's correct.

MR. HOOD. Correct.

SENATOR BINGAMAN. Now, am I right that part of the arrangement that you're discussing with Taiwan here does involve manufacture and subassembly. A substantially larger percentage of manufacture and subassembly of the MD-12 will occur in the Far East than would otherwise be the case if this arrangement——

MR. HOOD. Yes, sir, that is correct.

SENATOR BINGAMAN. And I assume that the same can be said of other follow-on products, that for a substantially larger percent of those follow-on products, manufacturing and, at least, subassembly would occur in the Far East.

MR. CULLIGAN. I think, if I may, it really comes down to where you're going to get the best price. If that comes back to the United States and stays in the United States, that's an opportunity that will not be denied based on this.

So, I think that it's a global environment. Aerospace, as has been mentioned many times today, already has global activity. And I think that you're driven to get price, but quality and price as a combination in this business.

SENATOR BINGAMAN. Well, let me ask about the subcontractors and the subtiers. We've had some testimony on that today.

As you see it, what is the competitive posture of the subtiers that supply McDonnell Douglas in this country? Are they able to compete with what is anticipated to be developed in Taiwan or in other Far Eastern countries?

MR. HOOD. Let me say, even today, Mr. Chairman, we produce about 16 percent of the MD-80 outside of this country, about 20 percent of the MD-11 outside this country. And, as you know, we've been involved in Mainland China for about 13 years in looking for low-cost solutions to our manufacturing goals.

But I also want to mention that I heard witnesses before me talk about their concern of not being able to participate in these products.

We still buy all of our electronics, avionics, engines, wheels, brakes, tires, ground power and test equipment, and final assembly tooling within the United States.

So, it's not like we're abandoning it completely.

But let me also say, as far as the subcontractors are concerned, we have to look for the lowest cost sources. And as second-tier subcontractors, they're going to have to learn to deal on a global basis, just like everybody else, in order to get themselves into a position of being high quality and low cost.

SENATOR BINGAMAN. But I am right, you're referring to 16 and 20 percent of the existing models being produced outside the country. With the MD-12, the estimate I've seen is that 60 percent of that would——

MR. HOOD. Sir, it's about 40 percent of the total cost of the program will be produced outside.

SENATOR BINGAMAN. Forty percent.

MR. HOOD. Right.

SENATOR BINGAMAN. I see. We've had some testimony already here today about the prospects for employment by McDonnell Douglas in this country, and what this proposed arrangement would mean as far as continued employment. What do you see in the way of future employment by McDonnell Douglas in this country versus elsewhere? What could you tell us about that?

MR. HOOD. Mr. Chairman, I can tell you that McDonnell Douglas is interested in job stability as much as anybody in this country. One of the things that we're looking forward to is creating that job stability by being able to develop additional products so that we can go compete in the world market.

I'd like to say, besides creating some new jobs, which we will at the U.S. greenfield site, we'll certainly save a lot of jobs by continuing to be in the commercial airline business. Again, by developing new products to compete worldwide, we will give much greater job stability to this industry than we've seen in the past.

SENATOR BINGAMAN. I guess that one thing that I'm still a little concerned about is the concern that you have on low cost. Obviously, that's a concern throughout industry. I don't claim any expertise in the aerospace industry, but low cost has not been a major factor in the industry until recently.

Are we in a situation where you are having to look for low-cost suppliers in order to compete with heavily subsidized competition?

Is that what's going on?

MR. HOOD. But, see, we haven't made any money in the commercial aircraft business for the last 25, maybe 30 years. That was long before Airbus came into being.

The facts are that we are in a fixed-price market. Airlines buy aircraft on the basis of the most competitive airplane out there, in terms of trip costs and per-seat costs.

So, we have only one side of the equation to work on. That's the cost side of the equation. And, in fact, we must be very aggressive in looking to that if we're going to generate the kind of profits needed to give us the ability to continue to develop new products.

SENATOR BINGAMAN. We had some testimony in the previous panel about the motivation of the Taiwanese investors for going into this arrangement.

What do you see them gaining from this?

MR. HOOD. They're certainly going to gain some experience in developing tooling and planning for large structures.

But let me also say that I heard earlier that there's not much experience there. You know, the Taiwanese have developed their own indigenous fighter. And they did that with electronic design of that product. And that's something that we have yet to do at McDonnell Douglas in the commercial industry.

So, I wouldn't exactly say that they're without experience. But they are without much experience in large structures on the commercial side of the business, and I think that's what they're looking for.

SENATOR BINGAMAN. Do you believe that part of this strategic plan that they have and that you earlier referred to is to develop this ... Mr. Mowery was referring to this web of infrastructure and capability to support the aerospace industry.

Do you believe that there will be an aggressive effort by the Taiwanese government to do that and to essentially develop subcontractors and subtiers that would go toe-to- toe in competition with those that we already have?

MR. HOOD. I think their real intent is to get some experience in this. I think that by being a part of us in a commercial industry that we can control that. Again, this is a U.S. company. We have the complete management control over it.

So, I think that we can guide them into the areas that we want them to develop. And I would think that they would want, since they are a partner of ours and will share 40 percent in the profits, as well as 40 percent of the costs, to be again the most aggressive worldwide, or have an aggressive worldwide strategic plan for low-cost quality manufacturing, and I believe they'll support that.

And if that continues to be in the best interest of Taiwan and that's the place where we can get quality and low cost, we'll continue to do that.

If not, we're going to look around the world until we have satisfied that requirement.

SENATOR BINGAMAN. But just——

MR. CULLIGAN. Senator?

SENATOR BINGAMAN. Go ahead.

MR. CULLIGAN. I'd like to add also, in dealing with the Republic of China, they do recognize that their size somewhat limits their ability to go into this market competitively to take on an Airbus, or a Boeing, or a McDonnell, in and of themselves.

So, I think that their goal really is to be a participant. I think that the opportunity here is to have them participating with a U.S.-based company in a major operation, as opposed to something else which may in fact be a grouping of nations in the Pacific that would start their own project, which would be very formidable to deal with for anyone.

SENATOR BINGAMAN. Well, I guess one thing that's concerning me in this is that the government of Taiwan has obviously made a strategic decision to get into this business. And they're willing to put government funds into doing that, along with private funds.

Wouldn't it be logical to assume that if they're doing that that they're also going to go forward with a strategic decision to assist their suppliers in gaining the subcontracts and the subtier work that relates to this?

And therefore, not only is McDonnell Douglas seeing a subsidy at the prime contract level, which it's becoming part of, but you have subcontractors, such as Mr. Goodreau and others, who are going to be up against heavily subsidized competition at the subcontract level.

MR. HOOD. Senator, I keep hearing the word subsidy. But I think the Taiwan government is entering into this on a commercial basis. I think that they expect a return, as Mr. Modzelewski said, on their investment, albeit, maybe not a great return to start. But I think that they do expect a return.

And the other thing that I'd like to point out is that it's a Taiwan government guarantee, not a Taiwan government investment.

At this point in time, I can honestly tell you that I don't know how much of that money is going to come out of the government. I think that a significant part of it is going to come out of private business entities in the Republic of China.

MR. CULLIGAN. Senator, I think that they're also very much concerned about the bottom line—that this be a commercial venture. This is not in any way causing us to reconsider our position with regard to the GATT talks and Airbus, on behalf of what we think is fair economic competition in this market.

So, I think, in all our discussions with them, to this point, they have said and made it very clear that this has to be an economically and commercially viable operation.

SENATOR BINGAMAN. Some of the Wall Street analysts who have looked at the proposed MD-12 have suggested a much higher cost than I think you folks have estimated for development of the MD-12.

I think that the McDonnell Douglas's estimate is in the range of $4 billion, and some of the analysts on Wall Street have come up with figures as high as $8 billion.

If, in fact, the higher figure turns out to be the fact, what would you expect to do in order to go ahead and be able to finance that?

MR. HOOD. I'm almost certain, sir, that $8 billion is not the number. If you're asking whether it's $4 billion, or $4.1 billion, or $4.2 billion, that may be within the realm of possibilities.

We have enough experience in this business now to be able to predict those costs a lot more accurately than that. We spent a lot of time on this program in developing the costs. I would not even want to speculate on a hypothetical case because I just don't think it's realistic.

SENATOR BINGAMAN. Well, do you feel confident that with this arrangement that you're entering into now, McDonnell Douglas will, in fact, be able to go forward and develop the MD-12 and market it?

MR. HOOD. Yes, sir. We have every expectation to do that. Of course, the market requirement and the market demand for that will give us the final say-so.

SENATOR BINGAMAN. Well, again, gentlemen, thank you for coming today. I appreciate it. I think that this has been an informative hearing. I don't know if we'll have additional hearings in the future or not on this, but I very much appreciate your coming and your coming the distance you did.

MR. HOOD. Thank you, Senator. It's nice to see you again.

SENATOR BINGAMAN. We'll conclude the hearing at this point.

Let me state for the record, if there are additional statements that people wish to submit for the record, we will leave the record of the hearing open for 10 days to 2 weeks.

[Whereupon, at 4:45 p.m., the Subcommittee adjourned, subject to the call of the Chair.]

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COLLISION COURSE IN COMMERCIAL AIRCRAFT: BOEING, McDONNELL DOUGLAS AND AIRBUS

THURSDAY, FEBRUARY 27, 1992

CONGRESS OF THE UNITED STATES,
SUBCOMMITTEE ON TECHNOLOGY AND NATIONAL SECURITY
OF THE JOINT ECONOMIC COMMITTEE,
Washington, DC.

The Subcommittee met, pursuant to notice, at 9:15 a.m., in room SD–628, Dirksen Senate Office Building, Honorable Jeff Bingaman (chairman of the Subcommittee) presiding.

Present: Senators Bingaman, Bryan, Sarbanes, Symms, Bond, Lieberman and Gorton.

Also present: Dorothy Robyn and Lee Price, professional staff members.

OPENING STATEMENT OF SENATOR BINGAMAN, CHAIRMAN

SENATOR BINGAMAN. The hearing will come to order.

This is a hearing of the Joint Economic Committee intended to look at the competition in commercial aircraft. This is a follow-up to a hearing that we held in early December on the proposed sale of 49.9 percent of McDonnell Douglas's commercial subsidiary to Taiwan Aerospace Corporation and other Asian investors.

Several of today's witnesses will address that issue as well as the larger issue of competition in commercial aircraft.

The proposed sale is symptomatic of a much larger problem. Boeing, McDonnell Douglas and their American suppliers face aggressive competition from foreign governments that have directly targeted the commercial aircraft industry, and the American firms receive little offsetting support from our own government.

Not only is the playing field not level, we are not even playing in the same game.

The stakes in this game are high.

The U.S. commercial aircraft industry generates $100 billion in sales and a $30 billion trade surplus. Boeing is our second largest exporter.

The three major benefits of that competitive advantage, to paraphrase President Bush, are "jobs, jobs, and jobs."

According to a report on Airbus released last week by the Congressional Research Service, each $1 billion of aircraft shipments by U.S. industry creates 35,000 jobs.

Our competitors understand that these stakes are high. As of 1989, European governments had provided $13 billion in direct subsidies to Airbus. That is the equivalent of $26 billion in private borrowing costs.

Those fat subsidies show no sign of ending. In fact, Airbus's response to talk of U.S. trade action has been to threaten retaliation.

Alan Boyd, U.S. Chairman of Airbus, recently told *Business Week*, "If Airbus has to give away airplanes, we will do it."

Japan, Korea, Singapore and Taiwan are also pursuing policies explicitly to create a domestic aircraft industry. In the absence of any coherent strategy by our own government, these foreign industrial policies create a strong incentive for American prime contractors to shift to overseas suppliers. This jeopardizes the future of the subtier supplier base which supports defense in this country, as well as commercial aerospace.

The proposed sale to Taiwan Aerospace would take this process one giant step further.

I do not fault McDonnell Douglas for pursuing this option under current circumstances, but I am not satisfied with their assurances that what Douglas would transfer to Taiwan is "mere metal bending" or manufacturing to spec know-how.

Bending metal to specification is not trivial. The skills required to accomplish this at low cost and high quality involve capabilities in designing and building machines, tooling process and quality control, fabrication of exotic metals and fasteners, and integrated manufacturing procedures.

If you teach someone else how to be the best at that, you have taught them many of the most sophisticated elements of advanced manufacturing today.

Nor am I satisfied that still more complex technology and know-how would not be transferred to Taiwan 5 or 10 years from now. If I was Taiwan Aerospace and I had purchased 40 percent of Douglas Aircraft, I would expect to receive a significant amount of technology in exchange, maybe not right away, but eventually.

Finally, I am concerned about the impact of the proposed sale on Boeing's future, particularly if a Douglas-Taiwan agreement were to result in yet another nationally subsidized aircraft manufacturer.

These concerns with the substance of the agreement are, I believe, shared by others in Congress. Of no less concern is the process by which an agreement between Douglas and Taiwan Aerospace is being negotiated.

The Taiwanese Government, which owns 29 percent of Taiwan Aerospace and effectively controls a far higher percentage of the equity, is sitting on one side of the negotiating table. Our own government, representing U.S. taxpayers, should be on the other side, but the

Administration, which continues to choose to view this as a private transaction between two companies, is nowhere to be found.

Let me just quote a sentence from the just-released Congressional Research Service report on Airbus:

> As additional nations demand a role in the production of the strategically and technologically valuable, commercial aerospace market, political will is becoming more of a determinant of market participation than are economic forces.

If the preservation of this industry does not justify a show of American political will, then I do not know what does.

We are very fortunate to have a distinguished group of witnesses today.

Before I introduce the witnesses, we also have a good participation by Senators. Let me defer to some of my colleagues for any opening statement that they would like to make.

First, Senator Kit Bond is here from Missouri. We are glad to have you, Kit. Go right ahead with any statement.

OPENING STATEMENT OF SENATOR BOND

SENATOR BOND. Thank you very much, Mr. Chairman.

I sincerely appreciate your allowing me to sit in with you and take this unusual step in joining the Committee for what is a vitally important issue in my state, and obviously to the country as well.

This proposal is of extreme concern to the people of Missouri, the workers in our aerospace industry, and those who hope to be able to gain jobs there in the future.

As you well know, McDonnell Douglas Corporation is headquartered in the state I represent. Recently, I took the unusual step of leading a Missouri delegation to Taiwan where we talked with the business people and the government officials to get a fuller understanding of this deal and to learn their views and approaches.

As a result of this, I have gained a good deal of knowledge about the proposed partnership, and I fully support it for a number of reasons.

First and foremost, I support it because it is in America's best interests. To remain a successful competitor in civil aviation, McDonnell Douglas must expand its current line of aircraft.

The proposed Taiwan partnership will enable McDonnell Douglas to produce a new aircraft—the MD-12—which will give the company entree to a new market segment, putting it in a stronger position against its U.S. and European rivals.

If McDonnell Douglas does not broaden its product line, it will lose its existing business and disappear from the civil aviation scene.

The consequences of losing McDonnell Douglas's commercial aviation business are dire.

A recent Congressional Research Service Report indicates that 80 percent of our economy is affected by aircraft production. Literally

hundreds of thousands of people could lose their livelihoods if McDonnell Douglas's commercial aircraft division were forced to close up.

The Taiwan Aerospace deal, and I should say more accurately the deal that Taiwan Aerospace is negotiating on behalf of Taiwan business interests not yet identified in Taiwan totally, would ensure that Americans will be supplying parts, performing the final assembly, and designing and testing new generation aircraft for many years to come.

McDonnell Douglas intends to build a new facility in the United States for the final assembly of the MD-12. The final-assembly technology, the critical component, the end process, will remain in the United States.

This plant will provide some 5,000 new jobs for American workers.

Defense cutbacks have already cost the St. Louis community very heavily. Over 10,000 St. Louis workers at McDonnell Douglas have been laid off.

According to a CBO study which was released within the last 10 days, if there were to be another $100 billion reduction in defense spending, the unemployment rate in St. Louis could go up as much as 2 or 3 percent more.

This, despite the fact that every Iraqi plane shot down in the Persian Gulf combat was shot down by an American aircraft built by McDonnell Douglas in St. Louis.

All economic theory and conjecture aside, this partnership means at least 1,500 new jobs in St. Louis alone, and I intend, Mr. Chairman, to do everything within my power to see that those jobs are there.

McDonnell Douglas is proposing an equity partnership with Taiwan business interests, not just to get the funds necessary to build a new-generation aircraft. McDonnell Douglas also realizes the importance of having a presence in the Pacific Rim where air traffic is expected to boom in the next two decades.

This does not mean, however, that McDonnell Douglas will become another Asian Airbus, as some have suggested. Both the Taiwanese business interests and McDonnell Douglas executives regard this as a commercial arrangement.

I can tell you that the bottom line is the bottom line. Profits, not subsidies, are what both sides of this partnership demand.

I heard this message very clearly from the Taiwan business people. They are doing a due-diligence study with both the Chinese and the best American firms to make sure that this is a commercially viable deal.

They want a profitable operation, not an opportunity to try to seek government subsidies. This is in sharp contrast to Airbus, which you and I, Mr. Chairman, have discussed previously.

Airbus has never made a profit. From a company offering a single plane 20 years ago, Airbus has been transformed into the only civil aviation company in the world offering a full product line of aircraft.

The success story has been possible thanks to the generosity—voluntarily or involuntarily—of the taxpayers of Germany, the United Kingdom

and France, all of whom have dumped $26 billion into this bottomless subsidy pit.

It is not remarkable that Airbus has succeeded. What is remarkable is that American aircraft manufacturers, who receive no such benefits, are still in the business.

The proposed McDonnell Douglas-Taiwan Aerospace arrangement is, and is expected to be, a legitimate business deal that will secure America's participation and continued preeminence in the aircraft manufacturing.

I believe, Mr. Chairman, it deserves our support, and I thank you again for the time.

SENATOR BINGAMAN. Thank you very much.

Let me now defer to the Chairman of the Committee, Senator Sarbanes, for any statement that he would like to make.

SENATOR SARBANES. Mr. Chairman, I want to commend you for holding this follow-up hearing to the one that you held earlier in December in order to examine this proposed sale of a very large percentage of McDonnell Douglas to Taiwan Aerospace Corporation.

I am sorry that I was not here in time to hear your opening statement because I know how carefully you have followed this issue.

I did listen to my colleague, Senator Bond, make a very eloquent statement on behalf of his constituents and the workers of McDonnell Douglas, and I understand that statement.

The people who ought to be on the griddle here are not McDonnell Douglas, but the U.S. Executive Branch of the United States government.

It is clear to me that Taiwan wants to move into the commercial aerospace business. And when I say "Taiwan," I am saying the government of Taiwan, which owns about 30 percent of Taiwan Aerospace.

We faced a similar situation with respect to Airbus. Alan Boyd, who is the U.S. Chairman of Airbus, was quoted in *Business Week* saying that if Airbus has to give away airplanes, "We will do it."

The one place where we earn a very significant trade surplus—some $30 billion—is in commercial aerospace. The United States was running very large trade deficits through the 1980s. The United States had been a creditor nation from World War I on. Since the mid-1980s, we have become a debtor nation, and with each passing year, increasingly so.

As long as we run a negative trade imbalance, we are going to continue to become even more of an international debtor nation.

I know that the Administration is dominated by rigid ideology. It is one of the sad commentaries of our time that while our competitors overseas are practical and pragmatic about trying to address these problems and to make a penetrating analysis of where their interests lie, we are here doing nothing.

When they go to the bargaining table, the government is on their side of the bargaining table. When our people go to the bargaining table, the government is nowhere to be seen.

Airbus started off a heavily subsidized operation. Look where they have come to now.

My perception is that a similar thing is now going to take place on the Pacific Rim, and I am anxious to hear from the Undersecretary of Commerce as to what the Administration's game plan is.

Are you simply going to sit there and let this happen?

I am prepared to concede that McDonnell Douglas faces problems. I do not want to differ with my colleague from Missouri on that issue.

How does the U.S. Government think that problem ought to be solved?

What is your forecast for what is going to happen to this $30 billion trade surplus in commercial aircraft, not this year or not next year, but five or ten years from now?

Is it all short-term bottom line in the Administration's perception, as well? Or is there some long-term thinking as to where this surplus is going to go?

Are we going to look at the trade figures 5 or 10 years from now and discover that commercial aircraft, which was giving us a $30 billion trade surplus, is now negative?

It has certainly happened in other economic sectors, and it has happened under game plans not very different from what is occurring right here.

Mr. Chairman, I commend you. I think that this is an extremely important hearing because it involves the broader question of whether our government is going to have a developed policy to assert legitimate U.S. interests in the face of other governments which do have such developed policies.

Thank you very much.

SENATOR BINGAMAN. Thank you very much.

Let me call on Senator Gorton for any statement he may have.

OPENING STATEMENT OF SENATOR GORTON

SENATOR GORTON. Mr. Chairman, I want to tell you how much I appreciate your concern and the concerns which have been expressed by the Chairman of the Joint Economic Committee on this issue.

I note that you have entitled this hearing "Collision Course in Commercial Aircraft of Boeing, McDonnell Douglas and Airbus," and that does show how vitally important this issue is to the national interests, not simply the interests of the State of Washington.

For that I owe you, and I believe the people of the country owe you, a genuine debt of gratitude.

Obviously you would expect a senator from the State of Washington to take a real interest in this subject. Boeing is the largest single employer in the state. It has more than 100,000 employees there.

It is the largest single exporter in the United States, as Senator Sarbanes has already pointed out. So, it is not simply the economic health

of the State of Washington which is at issue here, it is the economic health of the United States as a whole.

Having said that as an introduction, perhaps the most unexpected element in connection with this hearing is the fact that the Boeing Company is not unconditionally opposed to this sale.

It does not oppose foreign investment in its most significant domestic competitor, McDonnell Douglas. In fact, it feels that it will be better off if McDonnell Douglas is a vital part of the aircraft industry in the United States.

It does, however, have a critically important condition to attach to that support. Boeing does not oppose foreign investment in McDonnell Douglas if—if, and only if—the foreign investor is bound by traditional profit and loss marketplace operations.

We cannot stand either as a state or as a company or as a United States another Airbus situation to take place in the world, most particularly one which is not only not discouraged, but is actively encouraged by the government of the United States.

Boeing is more than delighted to compete head-to-head with any other commercial airline company and industry in the world, but it has to be a fair competition, and not one subsidized by a foreign government.

Now, I find the attitude and the help of Carla Hills, the United States Trade Representative, with respect to Airbus subsidies to be quite encouraging. With the possible exception of agricultural subsidies, the most important goal of the USTR in the current GATT negotiations is to dismantle in whole or in part those Airbus subsidies.

But I am not optimistic of the kind of success that I think all of us would like to see in those negotiations. That subsidy includes, and our concern over the subsidy includes, not just the building of aircraft, but the research and development that is at the heart of the Airbus subsidies.

Now, I also must say, as an individual, that I have always been a strong supporter of the Republic of China on Taiwan.

I believe that that country has shown a great ability to deal with a huge burden of defense with an absence of natural resources, and to become a profitable, a prosperous, and even an increasingly democratic country despite great difficulties. But it has been so successful that there is a huge surplus of tens of billions of dollars of capital in that country, and it has a relationship between the government of the Republic of China and its business community that is, bluntly, much closer and much more intimate than is the case here with the United States.

As a consequence, I have to start this hearing by expressing serious doubts that the proposed McDonnell Douglas-Taiwan Aerospace Company venture is a legitimate free-market investment.

Everything that I hear leads me to worry that we may be encouraging an Asian Airbus, something which would be very much to the detriment of the United States.

I feel that it is vitally important for the government, and for the Department of Commerce specifically, to study this proposal right down to the last comma and semicolon.

There have been reports that the government of the Republic of China has announced its intent to establish a commercial aerospace industry where none now exists, and to support it through funding, through tax benefits, and through other subsidies until it is successful.

There are statements by senior representatives of the Taiwan Aerospace Company itself that the government will—and I quote—"continue to invest in the Taiwan Aerospace Company until it makes a profit." This certainly cannot go without serious questions.

The Boeing Company is represented here today. It will share its concerns with us more eloquently than I possibly can, but the fact of jobs here in one place is not the ultimate question.

Airbus does subcontracting in the United States. There are communities in the United States which can say that they have a certain degree of employment because of Airbus. But that does not mean that competition is not tremendously detrimental to the economics of the United States, taken as a whole. And the mere fact of 1,500 jobs in one place, if they are controlled from outside the United States, does not match 100,000 jobs in another place within the United States that are controlled by its presently most successful exporter.

So, if this is a legitimate business investment on the same kind of profit and loss basis that would be the case with any investment here in the United States, we bless it, Mr. Chairman. But if it is a disguised Airbus, no matter how careful that disguise, it is very much against the interests of the United States.

SENATOR BINGAMAN. Thank you very much.

Let me see if the other senators have opening statements, as well.

Senator Lieberman, did you wish to make a statement?

OPENING STATEMENT OF SENATOR LIEBERMAN

SENATOR LIEBERMAN. Mr. Chairman, I appreciate your inviting me to come and make an opening statement, briefly. I do so growing out of the work that I have been privileged to do with you on the broader questions that are raised by the McDonnell Douglas-Taiwan sale that have been spoken to by yourself and others on the panel this morning.

We are obviously concerned about the acquisition of stock in McDonnell Douglas by Taiwan, but what we are also concerned about is that this represents a bell tolling for the American economy and the American government.

The question is whether we are going to hear it.

What is implicated here are the much broader questions that you have been a leader in the Congress on, Mr. Chairman. That is, the extent to which the U.S. Government must become a partner with American

business in the world economy today if we are going to remain competitive and protect American jobs.

It is as basic as that.

If we have gone now from the Cold War to the economic wars, I think we have to understand, while they are thankfully peaceful, they are not timid. They are very aggressive, very competitive, and right now, as indicated in this proposed transaction, we are sending our businesses out there to compete without the assistance that other foreign companies have from their governments.

This arrangement represents an aggressive move into one strong area of the American economy.

It is important to say that aerospace has gained some of the strength that it has because it is uniquely an example of what we used to call—and I suppose we can't use the term anymore—industrial policy.

The aerospace industry in America grew up because of the substantial role the American government played, particularly through defense spending, in sustaining and supporting the creativity and cutting edge competitiveness of that industry.

We are now in danger of losing it.

My colleagues have talked to you about the fact that there is an enormous trade surplus in aerospace. The Congressional Research Service did some studies awhile back that showed that the aerospace industry in the United States affects directly or indirectly 80 percent of our economy.

It is an astounding number.

For every dollar in shipments of aircraft, output of our economy increases by an estimated $2.30. We now control more than 60 percent of the world aerospace market, but that share is obviously eroding.

What is troubling to us here, as the European Airbus comes along and begins to cut into our share, is that it is coming along not on its own, but heavily supported by the governments of the European Community.

It seems to me, as we believe in the marketplace, if an American company is beaten by fair competition, then that is too bad, but that is the problem of the American company.

If an American company is beaten because it faces competition from a foreign company that is aggressively supported by the foreign government, then that is our problem. That is the problem of the American government. That is exactly what has been happening in the aerospace industry.

The level of subsidization that has been given to Airbus simply creates an unfair competitive advantage for Airbus. McDonnell Douglas cannot keep up. As time goes on, it is not hard to imagine that Boeing will be able to keep up with the competition.

I don't think any of us here have any bone to pick with the Taiwanese. They are our friends—what they are doing is natural.

The tragedy here is that when a great American company, McDonnell Douglas, felt that it needed to turn to government for support that it ended

up finding a warmer response in Taipei than it did in Washington, and that is what we clearly want to make sure does not continue to happen.

I appreciate this opportunity to speak. Basically, I think all of us here do not want to see this great American aerospace industry go the way of the consumer electronics industry in America.

I think with your leadership and the leadership of this Committee, and hopefully with some action by the Executive Branch of our government, that will not happen.

Thank you.

SENATOR BINGAMAN. Thank you, very much.

Senator Symms, did you have a statement?

OPENING STATEMENT OF SENATOR SYMMS

SENATOR SYMMS. I will be very brief, Mr. Chairman.

Thank you for your interest in this issue, and I think that this is in the interest of the people as well as the media, as you can see by the attendance here this morning. This is a very, very critically important issue.

I think Senator Gorton really hit the nail on the head when he mentioned equity investment. As Americans, we should not fear a straight equity investment in any of our industries. It may be that without this equity investment that the MD-12 will never be built.

So, what that would mean is that you would have Boeing building the 747 series, and as you know from the trade talks—and Senator Gorton also mentioned this—I believe that the Chairman of Airbus is quoted by you, Mr. Chairman, as having said that they would be willing to give those airplanes away if that is what it takes to keep them in the market with the subsidy.

I think that is a serious problem for all of us.

So, as I see this issue, we cannot overlook the competitiveness of this. I cannot think of any other nation on earth where we have better friends than the Republic of China in Taiwan. They have been loyal, faithful, and very consistently helpful to this country in times of need. I think that when I look at it and see that there is $90 billion in equity, in surplus cash in Taiwan, and we have a struggling industry, I just hope that we can resolve this issue, and keep another industry alive.

With the defense cuts, we have thousands of people being laid off from our major producers like McDonnell Douglas and others.

The Senate will be dealing very shortly with McDonnell Douglas on another issue. That is, whether or not McDonnell Douglas will be able to manufacture and produce 72 F-15s, and continue to keep their production line open, and keep people working.

The Senate will be speaking on that issue for export.

So, I think that this is an important issue and that the key to it is fundamentally whether it is an equity position.

If it is an equity position and there is interference with respect to competing against our other major airplane producer, Boeing, which comes from my part of the world, there is no opposition to it.

But I do think that the U.S. Government is proper to look into it and to carefully scrutinize what is happening. If it is a good equity position that will make more competition, tie an alliance between our long-time friends on Taiwan and the United States, and help an American company that employs thousands of Americans, then the U.S. Government should pretty much allow all this to happen and stay out of the way.

Thank you very much.

SENATOR BINGAMAN. Thank you very much, Senator Symms.

Senator Bryan, we are pleased to have you here.

OPENING STATEMENT OF SENATOR BRYAN

SENATOR BRYAN. Thank you very much, Mr. Chairman.

Let me join in commending you for your leadership on this issue and for convening this follow-up hearing.

The United States aerospace industry represents the crown jewel of America's industrial and technological excellence, and the health of that sector is of critical importance to our economy as we move into the twenty-first century.

The end of the Cold War presents our nation's industrial base with unprecedented opportunities. It also presents us with unprecedented challenges, as well.

The aerospace industry has long been a vital part of both our military and commercial success, and will play a major role in this transition from the Cold War to the economy of the twenty-first century.

The world in which we must now compete is filled with productive, well educated and highly motivated work forces whose efforts are encouraged and enhanced by coordinated governmental policies, and not limited by geographic or cultural boundaries.

The United States must not lag behind the efforts and innovations of others, or we will be left behind in an emerging international marketplace.

It is for that reason, Mr. Chairman, that I am deeply concerned about the pending McDonnell Douglas-Taiwan Aerospace venture.

All too often we have seen the genius of the American technological innovation become the core of highly successful foreign products.

One need only look as far as the family television, VCR, or the compact disc player to underscore that point. Although the aerospace industry is vastly different from the consumer electronics industry, the lessons of past decades should not be forgotten.

The ability of our leading-edge industries to prosper must be encouraged by a broad range of governmental actions, and we must be concerned about developments which threaten our strong industrial endeavors, such as the Boeing Company, one of the great success stories of modern industrial America.

For that reason, Mr. Chairman, the importance of what we undertake today and its impact upon the aerospace industry and infrastructure may be critically affected by the joint venture which is being examined.

The attractiveness of the aerospace industry is exemplified by massive investments of government subsidies that the European participants have committed to Airbus over the last 2 decades.

It is clear that their strategy has been successful since Airbus has now captured 44 percent of the commercial aircraft sales worldwide.

By some accounts, government subsidies needed for that success may exceed some $25 billion and amount to nearly $10 million in subsidies for each aircraft that has been sold.

All too often in the past, the Administration's response has been constrained to the framework of what I would consider ideological myopia. For that reason, we have to ask some very tough questions here.

Will the McDonnell Douglas-Taiwan venture amount to an Asian Airbus, with governmental subsidies underwriting the development expenses for new aircraft?

I note that this morning's *Washington Post* has an article which indicates that even without the additional Taiwan venture that the aerospace industry will have a 40 to 50 percent excess production capacity level by the year 2000. That is, assuming no new enterprise such as has been contemplated here.

What effect will this transaction have on Boeing and on the thousands of suppliers who contribute to its aircraft, the most complex commercial product that we produce?

Can domestic partners or other joint venture structures be utilized to assist McDonnell Douglas?

What steps has the U.S. Government taken to ensure that Airbus participants adhere to the GATT principles and compete in the world marketplace on a fair basis with Boeing and McDonnell Douglas?

And if the McDonnell Douglas-Taiwan Aerospace venture proceeds, what technology transfer protections will the U.S. Government insist be in place before the transaction is approved?

Mr. Chairman, I look forward to hearing from our very distinguished panel this morning, and I thank you again for your leadership.

SENATOR SARBANES. Mr. Chairman, could I just enter one figure in the record to follow up on something both Senator Gorton and Senator Symms said?

SENATOR BINGAMAN. Certainly.

SENATOR SARBANES. In the November 1991 Report to the Congress by the Treasury on "International Economic and Exchange Rate Policy"—which is required to be made every 6 months—the Treasury noted that:

> Taiwan's foreign exchange reserves have increased since 1990 to $76.4 billion in September, the world's largest stock.

Now, this is not the world's largest economy. It is a strong economy. It is a significant one. But it is by no means the world's largest.

Yet, Taiwan has the world's largest stock of foreign exchange reserves. In fact, the Treasury goes on to say that, "This level of reserves is excessive," pointing out that the trade policies that have been pursued have helped to build up this large reserve. But there is this huge pool of capital that is being held there by the Taiwanese government.

That only underscores their potential to move into this airplane sector.

SENATOR BOND. Mr. Chairman?

SENATOR BINGAMAN. YES, SENATOR BOND.

SENATOR BOND. If I might respond, I have visited with the head, or the deputy head, of the central bank in the Republic of China. They do have those reserves. They come about because the rate of savings has been as high as 40 percent, and now runs about 28 percent, personal savings.

The good news is that over the next 6 years they have planned a $300 billion capital investment program, which I think offers a tremendous opportunity for many other United States businesses to share in the repatriation of those earnings by providing goods and services.

As the Senator from Idaho pointed out, the Republic of China can and will be a very good trading partner for us.

SENATOR BINGAMAN. Before introducing the witnesses, I would like to ask that Senator Brock Adams' statement be included in the record.

[The prepared statement of Senator Adams follows:]

PREPARED STATEMENT OF SENATOR ADAMS

The proposed sale of a 40 percent share in McDonnell Douglas' commercial aircraft business to the Taiwan Aerospace Corporate (TAC) raises many serious questions. Both in a letter to the President and in legislation, I have joined with Chairman Bingaman and a number of Senate colleagues to outline my concerns.

While all of the questions raised merit close review, I am most concerned about U.S. competitiveness, specifically the potential loss of U.S. employment, the question of technology transfer, and the issue of government subsidy.

The Government of Taiwan is the driving force behind TAC. Indeed, it created TAC just last year in order to enlist the technological support of foreign partners. Clearly, Taiwan wants to position itself as a new force in the international airline industry. Years of trade surpluses have given Taiwan the largest foreign exchange holdings of any country in the world. The government is now strategically poised to buy its way into foreign markets.

At the same time that Taiwan is ready to flex its industrial muscle, McDonnell Douglas is in need of a large infusion of cash to prop up its commercial aircraft division. A major reason for McDonnell Douglas' financial situation, however, is the subsidized competition it faces in Airbus. We are not talking about a few small tax credits here. Over the past two decades, Airbus has received some $26 billion in assistance from the four member governments of its consortium. Caught between European subsidies on the right and Asian mercantilism on the left, the U.S. aerospace industry -- and the U.S. Government -- must now make some critical decisions about the future.

We need to be vitally concerned about the health of the U.S. commercial aircraft industry. Boeing and McDonnell Douglas together account for some 2 million direct and indirect jobs in the United States. Boeing has consistently been the country's number one manufacturing exporter. And the commercial aircraft industry continues to be one of the high-tech sectors in which the United States leads the world.

None of us who have raised questions about this proposal wants to see McDonnell Douglas forced out of the commercial aircraft business. But neither do we want to see the U.S. industry hurt by new subsidized competition from Asia. There must be some other way to assist McDonnell Douglas in its plight. Some other way than selling 49 percent of its shares to Asian partners with imposing government involvement. We all want the U.S. industry to continue to lead the world. And we want the industry to continue to provide the high-paying, highly skilled jobs that are the backbone of its commercial success.

One part of the solution must be for the United States to bring more pressure to bear on existing aircraft subsidies – both bilaterally and within the GATT. Another has to be stopping fledgling Airbuses before they get off the ground. That is what is at stake in the TAC deal. I hope that the U.S. Government, once a proposal is submitted, will take great care in assessing the potential impact on the domestic industry, including the impact on U.S. trade negotiations. And I urge the Administration not to approve any arrangement that will threaten the survival of this vital sector of our nation's economy.

SENATOR BINGAMAN. As the witnesses can tell, there is substantial interest in these issues, which I think is a very good thing.

Our first witness, whom we are very pleased to hear from, is J. Michael Farren who is the Undersecretary for International Trade in the Department of Commerce.

Thank you very much for coming, and go right ahead with your statement.

STATEMENT OF J. MICHAEL FARREN, UNDERSECRETARY OF INTERNATIONAL TRADE ADMINISTRATION, U.S. DEPARTMENT OF COMMERCE

MR. FARREN. Thank you, Mr. Chairman.

Mr. Chairman, I have a written statement which I have presented for the record. I will try to summarize it.

Mr. Chairman, I thank you for holding this hearing. I think it is obviously an issue that needs to be addressed and one that is rather complicated, as is demonstrated by the opening statements from members of the Committee.

I have been asked to address three basic issues: One, the health of the U.S. industry; two, the prospects for Airbus industry; and three, the growing trend toward international collaboration within the aerospace industry.

If I can, and I know that it would be helpful to go on quickly to the rest of your witnesses, let me go through these points quickly and then be open to your questions.

First, as was demonstrated by the opening statements, the aerospace industry is absolutely critical to the U.S. economy and our manufacturing base.

It provides highly paid work to highly skilled workers. It really constitutes one of the key technology drivers for new products, giving high technology products a vehicle to export.

It makes an enormous contribution to our overall balance of trade, as was mentioned—$29 billion for 1991.

By and large, the U.S. aerospace industry today is a healthy one. It faces some enormous challenges and, frankly, it is due to the fact that health, as Senator Bond, I think, pointed out, has been able to withstand some of the enormous competitive pressures of the subsidies offered to Airbus by the European Community.

Large transport aircraft sales in recent years have been expanding. In large measure, that expansion has tended to quell some of the natural reaction to the Airbus subsidies. With a growing market, there was less of an incentive to come in and take a very hard line on those subsidies.

We now see the market slowing down overall. In large measure, the aerospace industry is going to confront tremendous restructuring challenges as a result of the decline in defense spending.

We also see the financial health of airlines throughout the world—leading airlines-forcing them to cut back on some of their very aggressive orders and purchasing of new commercial transport aircraft.

Airbus Industry obviously is the primary foreign competitor to both McDonnell Douglas and Boeing. They have become a competitor, growing enormously in the last decade as a result of what we estimate to be in today's dollars—counting interest—about $25 billion in subsidies.

This was calculated through a study commissioned by the Commerce Department about 2 years ago, and has not been effectively challenged as a reasonable estimate of the degree of subsidization to Airbus.

Airbus Industry now serves as the number two supplier to the world's airlines of commercial transport aircraft, ahead of McDonnell Douglas. Again, this is the direct result of government subsidies, subsidies that we believe are in direct defiance of international trading rules and obligations under the GATT.

I might offer, Mr. Chairman, the point is that that is really the issue that needs to be addressed. The Taiwan-McDonnell Douglas potential alliance in investment is simply a symptom of what arises from these enormous government subsidies to Airbus.

Since 1984, the Administration has been involved in negotiations with the EC governments that offer these subsidies to Airbus. These negotiations have gone through a series of stages that continue at this time.

I have to admit, my patience as well as those of my colleagues in the Administration, and I am sure the patience of those on this Committee, is wearing thin.

We hope to have these negotiations concluded soon. It is important for them to conclude successfully because the potential consequences in our overall trading relationship could be extremely dire if we can't reach an understanding through a cooperative outcome from these negotiations.

The portion of the industry that manufactures the actual air frame, of course, is in the front line when you talk about Airbus subsidies, but we have to keep in mind that the globalization of the transport aircraft sector also presents challenges to U.S. engine manufacturers, subcontractors and suppliers.

Boeing and McDonnell Douglas have been described as, in large measure, enormous export trading companies. I know that Senator Bond has taken an interest in ETCs.

You can really think of Boeing and McDonnell Douglas representing the collective interests of literally thousands of suppliers in the United States that use those two companies as their principal vehicle to export their product in technology, which is why it is extremely critical that we offer the necessary support and deal with some of the international challenges that they confront.

In the end, we are going to be successful only if the industry meets the competitive challenge by lowering costs and continuing to stay ahead on the technology curve.

It is also absolutely critical that we eliminate the subsidies that foreign competitors now have.

We are committed to seeing that those subsidies come to a conclusion. We think that it is critical that they do so.

We also believe that subsidies overall, as Senator Gorton pointed out, need to be eliminated in all sectors so that we can rely on private industry to provide and allocate capital and foster industrial growth.

And that is really the question. The issue is whether or not we are going to have a commercial transport industry that is reliant on the private sector for capital; or, is this going to be a sector that is really an adjunct of government programs and a beneficiary of government subsidies.

That is precisely why McDonnell Douglas, in my view, is not in a position to find the capital for a new aircraft program here in the U.S. and has to seek it from a foreign source, because the private sector, when they evaluate the economic viability of a new aircraft program, constantly has to look at a foreign competitor that has the deep pocket of four government treasuries available to it, and has a policy which, I think, is represented in the quote of being willing, if necessary, to give aircraft away in order to keep production on line.

That is not something that allows any firm to go out to the private capital market and raise the necessary funds to undertake a rather risky effort to bring a new program on line.

That is why Airbus is the issue that we need to focus on, not the issue of Taiwan investing or making an equity investment in McDonnell Douglas. That is a symptom; not the related problems that we find in the engine sector of the industry with government subsidies growing as an important factor in that industry. The issue has to be the elimination of government subsidies.

Thank you, Mr. Chairman.

[The prepared statement of Mr. Farren follows:]

PREPARED STATEMENT OF J. MICHAEL FARREN

Introduction

McDonnell Douglas' decision to sell up to 40 percent of its commercial aircraft company to Taiwan Aerospace has raised concerns regarding this critical U.S. industry. The U.S. Department of Commerce will closely review this transaction and take part in any review of the matter conducted by the Committee on Foreign Investment in the United States (CFIUS) once McDonnell Douglas submits a filing with the Committee. Since no agreement has been finalized, and no CFIUS review has begun, I will focus my comments today on the general economic and competitive trends facing the industry.

The U.S. aerospace industry is a critical element of the U.S. economy. In 1991, aerospace ranked 6th in value of shipments, and 14th in employment among all U.S. industries. More important, aerospace is the nation's leading exporter of manufactured goods, sending abroad products worth an estimated $39 billion in 1991 to 135 countries around the world. Aerospace produces the largest trade surplus of any industry, approximately $29 billion in 1991. That trade surplus is equivalent to 42 percent of the 1991 merchandise trade deficit. Aerospace is also a leading technology driver in our country, utilizing a number of the technologies identified as critical by the White House Office of Science and Technology Policy, the Department of Defense, and the Department of Commerce.

The aircraft sector is the dominant and driving segment of

our aerospace industry. Aircraft, aircraft parts, and aircraft engines and engine parts represented 78 percent of aerospace's shipments, 73 percent of its employment, and 95 percent of its exports. With defense spending on the decline, commercial aircraft represent the foundation and the future of the industry.

The U.S. aircraft sector, whether large transport aircraft, other aircraft, engines, or aircraft and engine parts, faces the same three major issues: short term softness but long term growth in the commercial market, adjustment to defense cuts, and fierce international competition.

Large Transport Aircraft

The United States is the leader in the global market for large transport aircraft. U.S.-built aircraft make up almost 80 percent of world's fleet (excluding the former U.S.S.R.). The two U.S. manufacturers, Boeing and McDonnell Douglas, delivered 71 percent of the large transport aircraft delivered to the world's airlines in 1991. The two companies exported an estimated total of $19 billion worth of aircraft in 1991. They maintain 66 percent of the current world backlog of firm orders for large transports. They employ about 280,000 workers.

Leadership in the large transport aircraft sector, and in the military aircraft sector, has not come cheaply for these two companies. In fact, over the last 15 years, the two companies have invested over $9 billion in research and development. They have built their assets up from $4 billion in 1976 to almost $30

billion in 1990.

The future prospects for this sector are mixed. Defense cuts are having a significant impact. Boeing sells 20 percent of its products, by value, and McDonnell Douglas sells 60 percent of its products, to the U.S. Government, almost all of it to the Department of Defense and NASA. The implications of significant reductions in DOD aircraft procurement have not been lost on the two manufacturers.

In the past, business on the commercial side has compensated for the cuts in defense. However, the conflict in the Persian Gulf and the economic downturn during 1991 have had a devastating effect on airline traffic, producing the first downturn in airline traffic in the industry's history. This has led to massive losses by airlines, a slowdown in aircraft orders, some order deferrals, and a reduction in the production rates of some models by the manufacturers. This short term disruption is complicating efforts by the manufacturers to adjust to the defense cuts.

Long term, we are very optimistic about demand in the commercial sector. Airline traffic, especially international traffic, is expected to see strong growth throughout the rest of the decade. The industry forecasts deliveries of over 13,000 aircraft over the next twenty years. That is twice the number of aircraft delivered over the <u>past</u> twenty years.

Wide body, long range aircraft, those targeted for the fast growing international markets, will experience tremendous growth.

Industry forecasts predict annual deliveries of over 300 long range aircraft in 2010, compared with only 100 per year in 1991. Currently, in this segment, only U.S.-made aircraft, the Boeing 747 and the Douglas MD-11, are being delivered to airlines. Deliveries of medium range aircraft are also expected to increase.

The dollar value of global large aircraft deliveries over the next 20 years is likely to exceed $800 billion: one very large market in which the three aircraft manufacturers (Boeing, McDonnell Douglas and Airbus Industrie) will be competing.

This, I believe, is why the two U.S. companies are actively investing in their business. Boeing has launched a multi-billion program to build the 777, and is looking into a new jumbo jet program. McDonnell Douglas is seeking equity partners for its MD-12 program. The state-supported European competitor, Airbus Industrie, has invested heavily in new facilities for several new aircraft models and is also looking into a jumbo jet model. The three manufacturers, best able to assess the risks of their own business, have decided that this is a viable market place and one in which to invest.

This does not mean that success will come easily. Currently, U.S. manufacturers hold about 82 percent of the estimated value of the backlog for long range aircraft, 54 percent for medium range aircraft, and 65 percent for short range aircraft. The U.S. manufacturers are redirecting many of their resources away from the smaller aircraft segment towards the long

range segment. If successful, new technology entrants like the Boeing 777 and MD-12 could allow U.S. manufacturers to continue to lead in this industry. However, fierce competition, if backed by additional government subsidies to Airbus, will dampen these efforts by Boeing and McDonnell Douglas.

Airbus Industrie

Airbus represents Europe's main challenge to the U.S. civil aircraft industry. Airbus Industrie, the consortium responsible for coordinating development, production and sales, combines four European aircraft companies -- France's Aerospatiale, Germany's Deutsche Airbus, U.K.'s British Aerospace, and Spain's CASA. It has proven to be one of Europe's most expensive collaborative projects.

An estimated $25.9 billion in subsidies, including unpaid interest, has been provided by the Airbus partner governments -- the Federal Republic of Germany, France, Great Britain, and Spain -- to the development and production of Airbus aircraft since 1970. There is little likelihood that Airbus member companies can ever repay more than a fraction of these government funds. These subsidies have permitted Airbus to avoid bearing the full commercial costs and risks of its development and production decisions and allowed it to become the number two company in the industry behind Boeing. McDonnell Douglas is now third.

Additional subsidies are expected in the future, as Airbus launches new aircraft models. For example, the A350, a proposed

600-700 seat aircraft which would compete directly with Boeing's 747, is expected to require new government launch aid supports of between $4-6 billion.

This level of government support has generated grave concern on the part of U.S. industry. The market penetration of Airbus into the aircraft market has been rapid and, primarily, at the expense of the U.S. competitors, particularly McDonnell Douglas. Airbus market share of the large transport aircraft market has gone from 14 percent in 1981 to over 33 percent in 1991 based on the number of units ordered.

Based on industry concerns, the U.S. Government initially participated in developing the 1979 GATT Agreement on Trade in Civil Aircraft during the Tokyo Round. This Agreement designed to prevent governments from subsidizing commercial aircraft has proven ineffective in halting European subsidies in support of Airbus. Since 1985, the U.S. Government has tried to resolve this issue with the EC through extended negotiations in the GATT. Negotiations with the EC reached an impasse in early 1991 when the EC rejected a U.S. compromise proposal. The main stumbling block in these failed negotiations was the EC's unwillingness to drop their proposed ceiling of 45 percent on development supports to 25 percent. The EC refused to go below 45 percent.

After this breakdown in the negotiations, the U.S. Government initiated two separate actions under the GATT Subsidies Code: 1) in February 1991, the U.S. Government requested the formation of a GATT panel to review the German

exchange rate guarantee scheme designed to protect Deutsche Airbus from U.S. dollar denominated losses; and 2) in May 1991, the U.S. Government initiated a GATT Subsidies Code case involving the full range of subsidies and supports for Airbus.

The GATT panel established by the Subsidies Code Committee to review the German exchange rate scheme has not yet reported its findings back to the Committee.

Regarding the broader subsidies case against Airbus, in May 1991, the United States requested formal consultations under the provisions of the GATT Subsidies Code and subsequently held consultations with the EC in August 1991. The consultations did not result in a resolution of our complaints, and the United States referred the matter to the Subsidies Code Committee for conciliation. Following a September meeting of the Subsidies Code Committee where no resolution was achieved, the United States and the EC met on several occasions to further discuss the issue.

Last month it was mutually agreed to resume bilateral negotiations on aircraft trade issues with a firm deadline of concluding the negotiations by the end of March. To date, two rounds of bilateral discussions with the EC have resulted in no major progress. If progress is not made soon, the United States is prepared to pursue its GATT rights through the request of a panel. However, the U.S. Government has not ruled out resorting to U.S. domestic trade law including countervailing duties, anti-dumping cases and the filing of a Section 301 action.

The EC governments and the Airbus companies have made the continued existence of Airbus Industrie a priority. We expect Airbus Industrie to survive. Our strong desire is for Airbus to compete on commercial and technical terms and not rely on government subsidies which continue to undermine U.S. industry and distort international competition. If this is accomplished, we foresee a positive future for the entire large commercial aircraft industry. The U.S. Government is ready to take whatever action is necessary to ensure that Airbus competes on a fair and open basis.

Suppliers to the Large Transport Aircraft Industry

U.S. manufacturers of aircraft engines, engine parts, and aircraft parts shipped an estimated $50 billion of products, and employed 300,000 workers, in 1991. Engines and engine parts suppliers represent approximately one-half of that segment. Dominated by the two large engine manufacturers, General Electric and United Technologies' Pratt & Whitney, the engine segment is maintaining its global market position despite difficult foreign competition. Engines tend to be purchased by airlines independently from the aircraft, thus engine manufacturers are not affected directly by ventures such as the McDonnell Douglas-Taiwan proposed venture. The aircraft parts segment, however, is directly affected.

The aircraft parts segment of the aerospace industry is facing the same challenges faced by the large transport industry.

Defense cuts have led many military-oriented suppliers to diversify out of the defense market. The Air Force Association, in its report called "Lifeline Adrift," indicated that between 1982 and 1987 about 15,000 suppliers left the aerospace defense market. Undoubtedly, more have left the defense market since 1987.

The commercial market for aircraft parts has also seen a reduction in suppliers, driven not by sales volume, but by the demand for greater efficiency. During the 1980s, while Boeing and McDonnell Douglas production was increasing dramatically, their supplier base fell from over 11,000 to below 4,000. Fighting subsidized prices from Airbus, Boeing and McDonnell Douglas have concentrated their purchases with a smaller number of high quality suppliers. In doing so, the manufacturers have reduced the cost and increased the quality of their aircraft--so as to continue to be more competitive with the subsidized Airbus. For parts suppliers, this streamlining has meant that only the most efficient and highest quality manufacturers have been able to stay in this market.

Aircraft parts suppliers also face the challenge of further globalization of large transport aircraft. Boeing and McDonnell Douglas have gradually increased the foreign content of their aircraft. For instance, ITA estimates that the percentage of foreign products (excluding the engines) installed on the Boeing 727 was at the highest, 2 percent. Foreign products (excluding the engines) installed on the 767 probably represent closer to 15

percent, and on the 777, it may be almost 30 percent. For McDonnell Douglas, foreign products (excluding the engines) range from 15 to 20 percent of the aircraft value on the MD-11 and MD-80/90, up significantly from the content on the older DC-9 and DC-10.

The U.S. manufacturers have increased their purchasing from foreign suppliers for several reasons. The first is to increase their access to foreign markets. The use of offset agreements, where customers make their aircraft purchase contingent on offset manufacturing or servicing concessions, is very common in the military aircraft sector. Until recently, almost all airlines outside the United States were at least partially government-owned. This provided governments with a significant amount of leverage in the aircraft purchase negotiations to expect or even demand that local companies get contracts for spare parts or original equipment on the aircraft. Sometimes the relationship is only indirect, where offsets are not required but certainly improve the position of the manufacturer vis-a-vis its competitors. As McDonnell Douglas has told this Committee in the past, they believe their venture with Taiwan can increase their access to the fast-growing Asian market.

Foreign content also provides the manufacturers with access to foreign equity. Launching a new aircraft can cost a manufacturer $4 to $8 billion dollars, and can involve developing very risky new technologies. Foreign suppliers, often having a lower cost of capital, longer term strategies, and encouragement

from their government, are more likely than U.S. companies to become large, risk-sharing partners on new aircraft. Foreign companies may also be receiving financial assistance from their government, ranging from direct equity infusions for government-owned factories (e.g. IPTN of Indonesia) to loan guarantees (e.g. Japanese Aircraft Development Company). This assistance, if not given under commercial terms and conditions, can place a foreign supplier at an unfair advantage over a U.S. competitor.

The access issue can work both ways, however. U.S. companies do sell products to Airbus, and some have even become risk-sharing partners on certain Airbus models. U.S. products such as avionics, engine nacelles, and wing components fly on most Airbus aircraft. In response to the growing globalization of the aircraft market, U.S. suppliers have learned to work with as well as sell to manufacturers here and overseas. A marketplace free from government-imposed restraints is the key to getting the most efficient suppliers on everyone's aircraft.

U.S. Government Policy

The U.S. Government can support the aircraft and aircraft suppliers' industries by ensuring a domestic environment favorable to the international competitiveness of all U.S. industries. First, U.S. companies must not be at a financial disadvantage when it comes time to decide on difficult, risky, product development. As President Bush outlined in his State of the Union Address, we must lower the capital gains tax.

Second, the U.S. Government must invest in generic, basic research that increases the competitiveness of all U.S. companies. As you have seen in the recent budget request, the President is asking for higher expenditures on government-funded basic research in a range of scientific fields (including aeronautics); expenditures which will help U.S. aerospace companies compete. The U.S. Department of Commerce, through its Technology Administration, must continue to promote effective commercialization of new technologies. Technology Administration does this by fostering the transfer of technology from Federal laboratories to the private sector, by reviewing the domestic implications of international science and technology agreements, and by identifying legal, regulatory, and commercial barriers to the development and adoption of new technology.

Of importance to my agency, the U.S. Government must also ensure that U.S. companies can operate in an international trading environment as open as possible. To this end, the U.S. Government continues to push for a successful outcome to the Uruguay Round negotiations. Continued access to the international market can best be assured through a strong, multilateral trading system. An enhanced system -- which is the goal of the Uruguay Round -- implies clearer rules and disciplines, broader coverage, and a more effective means of resolving disputes among signatories. The draft Subsidies Agreement provides some improvements over the current multilateral disciplines and could provide the U.S. Government

with improved tools for dealing with foreign government subsidy practices that have distorted trade flows.

The International Trade Administration (ITA) also continues to promote U.S. exports. ITA's U.S. and Foreign Commercial Service has a staff of over 1200, located around the U.S. and in 68 countries around the world, providing export counseling to U.S. industry. ITA's Trade Development promotes U.S. aircraft industry products at numerous international air shows (most notably the Paris, Farnborough, and Singapore Air Shows) and has led U.S. aerospace companies on trade missions around Europe and Asia. Efforts such as these are critical for helping companies, especially small- and medium-sized companies, to successfully compete overseas.

SENATOR BINGAMAN. Thank you very much.

Let me ask a few questions before deferring to others.

As you indicated, we have been negotiating with the Europeans about Airbus since 1984. We still do not have any agreement.

As I understand it, the present Administration's position is that we are trying to negotiate them down to what we have tentatively considered to be an acceptable level of direct government support for Airbus, rather than the complete elimination of subsidies.

Can you explain to me how you come to a conclusion that there is an "acceptable level of direct government support"?

It would seem to me that all the statements that you have heard here this morning have, at least, tried to get back to the idea that we are going to eliminate government support. What is our government's position?

Are we willing to accept some level of government support, but just not as great a level as we now have?

MR. FARREN. Mr. Chairman, I would agree with you. I think the ideal situation is simply to get the government out of the business.

For a long time, Airbus took that to mean that we wanted to see the demise of Airbus. That is not the case. We want to see them operate on a commercial basis, relying on private capital.

In consultations with the U.S. industry—and, in fact, most of the negotiations have had the benefit of U.S. industry representatives along or nearby as we have conducted these discussions—with the advice of the U.S. industry, we have discussed with the Europeans a package that would significantly reduce the subsidies, limit the subsidies to development costs, and also provide for some guaranteed repayment of the subsidies and support offered by the Airbus governments.

We have never reached a conclusion on that. Frankly, ideally we would still like to see government subsidies come to zero.

I think our industry agrees with the U.S. Government's position that it is most important at this point to get the subsidies under control and have them be predictable.

SENATOR BINGAMAN. I guess, one concern I have, which I just need to express at the first here, is that as we negotiate that Airbus continues to gain larger and larger market shares.

Starting in 1989, according to the figures I have, they had 23 percent of the deliveries in the world. It went down to 17 percent in 1990. Up to 21 percent at the end of 1991. In 1990, they accounted for 30 percent of the total commercial aircraft order backlog.

In the first 9 months of 1991, they accounted for 34 percent of the commercial aircraft order backlog.

It seems to me that the trend is pretty clear. The longer they can keep us talking, the more market share they gain.

Is this a reason to bring this thing to closure?

MR. FARREN. I think it is, Mr. Chairman. You are right. The status quo operates in their favor, particularly if they can manage to launch a new program before there is an agreement on the level of subsidies.

Clearly, if I were a European Community negotiator on behalf of the four Airbus governments, one of my key objectives would be to play for time, to keep us talking as long as they possibly can.

That is precisely why we have laid out March 31 as the date that we feel we need an agreement of current discussions, or we are prepared to move on to call for a GATT panel.

SENATOR BINGAMAN. So, that would be the sanction?

We call for a GATT panel at the end of March if nothing happens?

Is that the only action that is available to our government?

MR. FARREN. Mr. Chairman, that is an action that we have already employed when it comes to the German supports—the so-called "currency guarantee" to MBB. We have been successful, preliminarily, in the panel report in that case.

We also did initiate a broader GATT case, and that is what we are proceeding on now. The next step would be to call for a panel. Your question is, what else can we do beyond relying on the GATT system?

We could also make use of U.S. countervailing duty, antidumping law, and we could also utilize Section 301.

SENATOR BINGAMAN. Are any of those under consideration?

MR. FARREN. Mr. Chairman, all of those have been on the table for discussion for some time. They are issues that we regularly raise with our European counterparts, and they are issues that we discuss with the U.S. industry as options on a regular basis.

SENATOR BINGAMAN. Getting to this McDonnell Douglas proposed sale, I know you indicated that it is just a symptom of a larger problem, but I think our treatment of it, as a government, may be symptomatic of a larger problem, too.

Specifically, I am referring to the fact that on November 30 that those of us here in the Senate sent a letter to the President asking that he take action to investigate this proposed sale, and get back to us as to what our government's position was.

I got a letter from Brent Scowcroft, dated January 27, which says:

> While the Administration has not taken a position on this matter, since the parties are still engaged in discussions, we can rest assured that CFIUS, which is this Committee on Foreign Investment in the United States, under the Exon-Florio Amendment, you can be assured that CFIUS will conduct a thorough and objective review of the proposed transaction to determine if it is in our national security interests.

I guess there are a couple of concerns that I have about this.

First of all, is it our Administration's position that our government should not get in and investigate anything like this unless and until there is a completed agreement?

I mean, I know that CFIUS is triggered when there is a completed agreement, but that does not mean that you are prohibited from taking action prior to that time.

What we were urging in our letter was that you do that, that you get in there ahead to try to close the door before all of the horses are out.

MR. FARREN. Mr. Chairman, we have had an opportunity to look at—at least, the open reports, thus far—what the deal may entail, but the formal CFIUS process would not be able to get underway until there was an actual document on the table describing just what form it would take.

The issues that CFIUS deals with, in keeping with the Exon-Florio Amendment that CFIUS relies on for its authority, relate to national security.

The principal component of the review would be on what are the implications on national-security-related technology arising from the deal, and particularly defense programs, for example, that McDonnell Douglas currently has responsibility for.

SENATOR BINGAMAN. I understand that is what CFIUS is focused on, but why does not the Secretary of Commerce, if not the President, call a meeting of the key officials in the various companies involved— Boeing, McDonnell Douglas, others—and at least look into the issue of whether the U.S. Government should concern itself with the structure of the agreement which is being worked out?

It seems to me that when you have the government of Taiwan on the other side of the table that it is not unreasonable for our own government to take some interest.

MR. FARREN. Mr. Chairman, we have taken an interest. We have had an opportunity to talk with individuals within the industry—McDonnell Douglas and Boeing and other experts.

We have also had an opportunity—I have personally—to talk to Taiwan officials on a private basis on just what their view is, and what form of review is Taiwan currently going through itself in terms of potential public support to an MD-Taiwan deal.

So, we have done that, but it has been done on an informal basis.

SENATOR BINGAMAN. Is it possible to get anything a little more formally done in the way of actually looking at it, doing an analysis of it, short of CFIUS?

I understand that CFIUS is limited to national security issues. We have not passed a statute saying, when there is a significant issue affecting a major American industry, the Department of Commerce ought to take an interest in it. Obviously, that would be my sentiment.

Is there a way to get something more done on this, other than just waiting until the deal is finished?

MR. FARREN. Mr. Chairman, I do not think that we are "just waiting," although in a formal sense, we have to see what form the deal finally takes.

How much in the way of public funds would be involved? Will there be a public guarantee, or a loan guarantee, or a direct support through funding? How private is the deal going to be?

We are very much in favor of private equity investments. We have an open investment policy.

We are concerned when government entities get involved in any transaction. And the Taiwan authorities are not alone in looking at public support to the aerospace industry.

That is why we are attempting to deal with the broader question in the Airbus negotiations. Any outcome that we ultimately have with the European Community, on a bilateral basis, we want to multilateralize.

One thing that I raised in my informal, private discussions with some Taiwan officials was the merits, particularly if Taiwan does finally join the GATT, of committing right now to join in any multilateral agreement controlling government subsidy to the aircraft industry.

We think it is important for Taiwan to consider that and make a commitment up front to do so.

SENATOR BINGAMAN. But now, if I understand it, you are saying that if we were to negotiate an arrangement with the Europeans, whereby there is a certain level of direct government support for Airbus, then that would be acceptable in the case of Taiwan, as well; that they could provide a level of direct government support through this kind of an arrangement? Is that what you are saying?

MR. FARREN. We would hope any outcome on Airbus bilaterally with the European Community would be multilateralized, so all governments that have an aircraft industry in its country would sign onto the negotiated outcome.

SENATOR BINGAMAN. Well, to follow the logic, would we then provide a direct government support to Boeing?

I mean, if Boeing is the only one in the game that does not have direct government support, isn't it a little unfair to Boeing that you work a deal with the Europeans where they can have a certain level of direct government support for Airbus, work a deal with the Taiwanese where they can have a direct government support for the McDonnell Douglas MD-12, and Boeing is left unprotected or unsupported in this competition?

MR. FARREN. Mr. Chairman, let me say again that our ideal would be to simply get all governments entirely out of the business of supporting this industry. To the extent that we can do that, that remains our objective.

In consultation with our industry, they believe that control over subsidies at this point is equally important to finally reaching that ideal. I think that would have to remain our objective.

Now, at this time, as I indicated, the U.S. aircraft industry has had a sense that a limited level of government support for the purpose of launching or developing a program would be acceptable.

SENATOR BINGAMAN. Let me ask one other line of questions, and then I will defer to my colleagues here.

There have been a lot of examples—at least, I am informed that there have been a lot of examples—where foreign governments use landing rights as a way to sell aircraft.

One example, at least as I am informed, is that Airbus recently won an order from Singapore Airlines by agreeing to provide valuable landing rights to French airports.

There are other examples like that.

I guess what concerns me is that that is in such stark contrast to the way we do business.

At the earlier hearing that we had on this, I raised the fact that shortly after the end of the Persian Gulf War that the government of Kuwait went out and bought a bunch of Airbuses. It would seem, if there were ever a situation where our government would be able to influence the actions of another government, it would have been the government of Kuwait shortly after the Persian Gulf War.

Do we ever consider that? Does the Department of Commerce, the Administration, ever consider taking some kind of action to help U.S. aircraft manufacturers sell planes abroad?

MR. FARREN. Mr. Chairman, we have been very aggressive on that point. Our objective is not necessarily to intervene to bring political pressure down, for example, on a government-owned airline to buy U.S. aircraft, but to make certain that other inducements, such as landing rights, are not the deciding factor; that we can come in and counterbalance those and urge the government or the airline to make a decision based on the commercial and technical merits of the proposed sale.

We have done that repeatedly.

We did it in the case of Kuwait. In fact, *Business Week* had a story 3 or 4 weeks ago outlining the progress of U.S. firms in Kuwait, and pointed out that Secretary Mosbacher took a very aggressive approach on aircraft sales. It is our belief that Kuwait will be purchasing U.S. aircraft, and it will ultimately be a mixed deal between Airbus and U.S. purchases to replace some of the destroyed aircraft and expansion by Kuwait Airways.

We have also weighed in very heavily when any evidence or allegation is made that landing rights, or any other inducement, is involved in a sale. That has gone all the way to the President and the Vice President, when necessary, stating their concern that decisions be based only on commercial and technical aspects of the proposed purchase.

We are not hesitant to do that.

Strangely enough, we are sometimes criticized as a government for getting involved in any commercial transaction, or offering any degree of statement of interest in it. But that has not deterred us from doing so.

SENATOR BINGAMAN. Well, I will conclude by saying that I think that there must come a time at some point where we quit pleading with everyone else to pursue the free market, and begin to play by the same rules that they play by. It seems to me that that time has come and gone, but obviously we are in disagreement on that.

Senator Bond?

MR. FARREN. I don't think so, Mr. Chairman. I think we are very much in agreement on that.

SENATOR BINGAMAN. You agree that the time has come and gone?

MR. FARREN. Well, I don't know as it has come and gone. I think the time has come to be prepared to take a very aggressive approach on these issues, which is what the Bush Administration has been doing for 3 years.

SENATOR BINGAMAN. Senator Bond?

SENATOR BOND. Mr. Chairman, to begin with, Mr. Farren, in a lighter vein, since people were suggesting the breadth of inquiry that would be appropriate for the Secretary of Commerce, I am a strong supporter of the St. Louis Cardinals and the Kansas City Royals. I have heard a proposal being bandied about in the Northwest to sell a majority, perhaps a very significant share of the Seattle Mariners to Japanese interests.

If there is one thing that we do not want to compete with in major league baseball, it is a Seattle Airbus.

I just wondered if, by any chance, the Secretary of Commerce was going to be inquiring as to whether the equities and the potential of our major league baseball teams might be upset by such an investment?

MR. FARREN. Senator, I think that there are things in place within the structure of the private-sector aspects of managing U.S. baseball to deal with that issue.

I think the Commissioner of Baseball has all the capacity he needs to deal with it.

SENATOR GORTON. I can assure my colleague from Missouri that the St. Louis Cardinals, at least, will never need to worry about it unless and until they get to a World Series, which looks to be a long way off.

[Laughter.]

SENATOR BOND. We may be there before you are unless you use the subsidies. But welcome to the big league, Senator Gorton.

[Laughter.]

SENATOR BOND. I would like to turn back to the subject at hand and ask: In your written testimony you mentioned the percent of current commercial aircraft which are produced abroad.

Could you just give us briefly some of the figures that I think you have cited there for the record, some of the current commercial aircraft, U.S.-manufactured?

MR. FARREN. Let me see if I can give you a breakdown on that.

SENATOR BOND. What is the Japanese percent, for example?

MR. FARREN. Well, U.S. aircraft, total delivered in 1991, was 596; Airbus, 163; a total of 759.

SENATOR BOND. No, I was referring to the percentage of the existing commercial aircraft, the MD-80, the 747, the 767, which are produced abroad.

MR. FARREN. In terms of the percentage of the U.S. component?

SENATOR BOND. Yes. How much is made abroad for each MD-80, each 767?

MR. FARREN. Let me go back and get the specifics for you, Senator.

[Pause.]

Foreign products, excluding the engines, installed on the 767 probably represent close to 15 percent; and on the 777, it may be almost 30 percent; for McDonnell Douglas foreign products, excluding the engines, it ranges from 15 to 20 percent of the aircraft value on the MD-11 and MD-80/90, and we note that is up significantly from the content on the older DC-9 and DC-10.

SENATOR BOND. With respect to the portion, say, of the 767 and on the 777, which are manufactured in Japan, does the Department of Commerce have access to the information that would enable you to determine whether there is a subsidy by the Japanese government through MITI for that production?

MR. FARREN. It is something that we look at, Senator. I can't guarantee you a 100 percent capability of examining the issue of subsidies, but——

SENATOR BOND. Do you have enough information to know?

MR. FARREN. Our judgment is that there is not a subsidy at this stage to that.

SENATOR BOND. There have been requests expressed here and elsewhere for more government oversight of the proposed aircraft purchases and production overseas.

To what extent do you have adequate review authorization now? And do you need additional power to allow you to make determinations on the proposed MD-12, or the existing 767, or the existing MD-80?

Do you have enough information to satisfy you?

MR. FARREN. Senator, at this point I think we do have sufficient information to make some basic judgments.

SENATOR BOND. So, you do not need additional power?

MR. FARREN. I would not say so, Senator, no.

SENATOR BOND. Let me conclude by jumping to something that the Chairman's statement really set me to thinking about.

You said earlier that we are terribly frustrated over the inability to come to closure on dealing with the Airbus subsidy issues.

We have been around the horn again and again and again and again. We keep getting put off, delayed. We have seen this process go on so long.

The Chairman has mentioned landing rights. What if we suggested something that would make Airbus and the Airbus countries get serious about it?

What would be wrong with the U.S. Government saying, for example, unless the subsidy process is ended, no Airbus Airplane delivered after January 1, 1994, would be allowed to land in the United States?

MR. FARREN. That would certainly get their attention.

[Laughter.]

SENATOR BOND. Nothing else has. Why do we not do something like that?

MR. FARREN. Senator, the dilemma on that is that it really does come down to a two-way street. U.S. airlines do quite well on routes to Europe.

And, for that matter, the U.S. industry has done quite well in selling to European airlines.

That has constantly been the dilemma, going back to 1985. The U.S. Government frankly has been prepared, back into the Reagan Administration, to take a very hard line on this because we realize how critical it is to the manufacturing base.

We have had to temper our approach in consultations with the U.S. industry—both the aircraft manufacturers and the airlines—in terms of the potential implications, and whether it is worth moving into a mode that could lead to a trade war.

That has led to the long-term negotiating strategy that we have undertaken.

SENATOR BOND. Well, perhaps it has become so long term because we have entered into a long-term negotiating strategy. I would suggest that there are some of us here, in just talking with my compatriots, there are some in the Congress who may not be as reasonable as the negotiators in the Executive Branch, and who may want to pursue some very significant measures if we don't see some progress; whereas, we have continued to go around the oval track too many times on this negotiation process.

Thank you, Mr. Chairman.

SENATOR BINGAMAN. Thank you.

Senator Sarbanes?

SENATOR SARBANES. I thank you very much, Mr. Chairman.

Mr. Farren, in your written testimony, I am really struck by the enormous mismatch between your statement of the problem, which I thought was a perceptive one, and the conclusion in which you talk about what we are trying to do about it.

Let me just take you through your statement in order to underscore the gap that I perceive. And I notice you smiling. Maybe you perceive it, as well.

Now, in the beginning you talk about how critical the U.S. aerospace industry is to the U.S. economy.

> Aerospace produces the largest trade surplus of any industry, approximately $29 billion in 1991. It's the dominant and driving segment of the .... The aircraft sector is the driving and dominant segment of our aerospace industry.

You then talk about Boeing and McDonnell Douglas.

> U.S.-built aircraft make up almost 80 percent of the world's fleet, excluding the former U.S.S.R. The two U.S. manufacturers, Boeing and McDonnell Douglas, delivered 71 percent of the large transport aircraft delivered to the world's airlines in 1991; exported an estimated total of $19 billion worth of aircraft. They maintain 66 percent of the current world backlog of firm orders for large transports, employ about 280,000 workers.

And you talk about the importance of this industry, its success, and the high skills that are involved. It is clearly a high-skill, high-wage industry, which is just what other countries are trying to get.

It is also an industry in which we have been very effective in terms of fair competition.

You then talk about the subsidies for Airbus:

> An estimated $25.9 billion in subsidies, including unpaid interest, has been provided by the Airbus partner governments, Germany, France, Great Britain, and Spain. There is little likelihood that Airbus member companies can ever repay more than a fraction of these government funds.

What fraction would you estimate?

MR. FARREN. It all depends on what timeframe that you are looking at. Airbus is not going to be a profitable undertaking for a long time, even under current circumstances.

SENATOR SARBANES. So, I would not be wrong if I just said "ever repaid," actually, would I?

You then say:

> The subsidies have permitted Airbus to avoid bearing the full commercial cost and risks of its development and production decisions, and allowed it ... the subsidies ... allowed it to become the number two company in the industry behind Boeing. Additional subsidies are expected in the future for Airbus.
>
> The A-350, which is going to compete directly with Boeing 747, is expected to require new government-launch-aid support of between $4 and $6 billion.

So, on the one hand, you make an analysis, which I share, about the importance of the aerospace industry to the American economy and its successor. This is not a question of picking winners and losers. We already have a winner, and it continues to be a winner, but under enormous stress and pressure.

Then you talk about the supplier situation, and how some of that is falling. Then you get down to the U.S. Government policy.

Here we have set this picture of the importance of this sector, this incredibly heavy commitment on the part of the Airbus to the European countries, the amount of underwrite that they are given in order to come into this market and to compete. Then, we get to the U.S. Government policy.

Paragraph one says to lower the capital gains tax. I know this paragraph is now standard-issue in the Administration, and there is no program that comes here without a standard paragraph that says we have to lower the capital gains tax.

Second, the U.S. Government must invest in generic basic research that increases the competitiveness of all U,S. companies. Then, you talk about technology administration, technology transfer.

Third, the U.S. Government must also ensure that U.S. companies can operate in an international trading environment as open as possible. To this end, the U.S. Government continues to push for a successful outcome to the Uruguay Round negotiations. That could be significant depending on the outcome of the negotiations, but I am going to question you about that in a minute.

Finally, you say that "the International Trade Administration also continues to promote U.S. exports." You talk about how much staff they

have around the world to provide export counseling to U.S. industry. They promote U.S. aircraft industry products in numerous international air shows, most notably the Paris, Farnesborough and Singapore Air Shows, and they have led U.S. aircraft companies on trade missions around Europe and Asia.

Well, now this is all small potatoes, isn't it, for the problem that we have?

Do Boeing and McDonnell Douglas really need to go to the air shows in order to make the case for their large transports?

MR. FARREN. Yes.

SENATOR SARBANES. They have these orders.

MR. FARREN. They really do. There needs to be a heavy presence by U.S. manufacturers in these shows.

SENATOR SARBANES. But isn't it the subsidy that Airbus is getting making the difference in the competition?

MR. FARREN. It has certainly gotten——

SENATOR SARBANES. If Airbus was not getting a subsidy——

MR. FARREN. It would not exist.

SENATOR SARBANES. It would not exist. So, it would be Boeing and McDonnell Douglas, would it not? That is the critical issue, is it not?

MR. FARREN. Absolutely.

SENATOR SARBANES. Where is the proposal to deal with that critical issue?

Either they should stop subsidizing, or we have to get into this business.

We gave the Administration a war chest in the Export-Import Bank. We, in effect, said that they ought not to be underwritten. These are tied-aid credits that other countries provide in order to win the contracts for their manufacturers at the expense of ours.

So, they shift the competition off of a straight cost-quality competition and add in a subsidy element provided by the government.

The idealogues in the Reagan Administration—and it seems to have carried through to Bush—they did not want any part of that. No, no. We are simply going to let the market work.

Well, of course, the other countries are not simply letting the market work. They are intervening in the market in order to win the contract.

So, in the Banking Committee, we said that we are going to give you a war chest. The purpose is for everyone to stop subsidizing and to compete directly on cost and quality.

MR. FARREN. And we have made no progress.

SENATOR SARBANES. But if other countries will not do that, then we are going to be in the game with them, as well. We have deep pockets, and we are going to play that same tough game at the bargaining table.

Now, why are we not doing it here?

MR. FARREN. Senator, unfortunately, we may have to move on to that. You are right.

SENATOR SARBANES. Well, when?

We have delayed long enough now that Airbus is now number two. When are we going to do this?

You are talking now—when you talk about these GATT negotiations—as if we can expect that the Europeans will, in effect, seize market share by scaling back their subsidies substantially. Do you think they will ever agree to that?

I mean, they are now in this game. They have laid out this money. They have these jobs, and they are getting these contracts.

What do you mean when you say that we "may" have to get to that?

I agree with the Chairman when he said earlier that the time has "come and gone." I think that was the expression that the Chairman used.

There needs to be some sense of urgency about this problem, or our lunch is simply going to be eaten. We are really being had here, in my perception.

This is not straight-out competition. In any straight-out competition, Boeing and McDonnell Douglas win, hands down.

I have not heard anyone contend to the contrary. Now, what has happened is that the U.S. Administration has refused to fight for the U.S. interests and, in effect, has allowed the Europeans to underwrite the development of an aerospace industry, and they moved in there to the tune of a lot of money. A lot of big money.

They are now in there. McDonnell Douglas is now number three instead of two. It has pressure. It is looking for equity capital. Taiwan Aerospace comes in with a very significant share in it on the part of the Taiwanese government.

So, you can anticipate that they are going to move to be into the aerospace industry.

Now, what are we going to do about this?

Boyd, a former U.S. Secretary of Transportation—now the Airbus head in the U.S. or in North America, I guess—says he is going to give the planes away if they have to.

What is our government doing? What are we going to do about that?

Fine. I want you to go to the trade shows. I know you want to put in this paragraph about capital gains in every statement, and generic and basic research. The Uruguay Round, I agree. That is, in a sense, critical. But where is the tough strategy that has some hope of leading to success?

MR. FARREN. Senator, since 1989, we have taken a very aggressive approach on this in negotiations. We brought one GATT case on the German subsidy program for currency guarantees, successfully, with an outcome on that.

We said that if we are not successful by March 31 that we are prepared to call for a panel in the other GATT case that we brought on the broad subsidies. We have also made it clear that we are prepared to consider any case brought by the industry on countervailing duty or dumping charges.

Certainly, Section 301 is available, too.

Senator, we have taken this approach since 1985, that it has to be a common position of the government and the private sector. Clearly, short-term and medium-term commercial considerations have tempered our approach because the U.S. industry has consistently done well in the European market over those years.

I don't disagree with you. The long-term perspective is much more dire, and we have to deal with these subsidies, and that is the direction we are moving in.

I think that we are getting to the stage where there maybe an agreement between the government and the private sector on what action it should take.

SENATOR SARBANES. Well, are you into this negotiation in a way to try to shape it to deal with some of the problems that we foresee? Or, are you simply waiting for the negotiation itself to conclude, and then look at the outcome of the negotiation?

MR. FARREN. No. The Commerce Department and the U.S. Trade Representative have been actively involved in this jointly. And, frankly, we have made certain——

SENATOR SARBANES. When you say "this," you mean?

MR. FARREN. The negotiations with the European Community's representatives.

SENATOR SARBANES. No, on the McDonnell Douglas-Taiwan.

MR. FARREN. I am sorry, Senator. No, we have not. We have consulted with the industry. We have consulted with the officials from Taiwan, but we are certainly not parties to the transactions.

SENATOR SARBANES. Why not?

I don't know that you should be parties, but why aren't you involved in trying to shape the outcome of these negotiations in a way that deals with some of the problems that are now being put to you?

Otherwise, here's what's going to happen. The negotiation is going to be completed. The package is going to be brought to you. And, in effect, you're going to have to say yes or no on this package.

There's then going to be tremendous pressure that you should say yes, because they would argue, "Well, it's essential. We don't have anywhere else to find equity capital." And so forth and so on.

I assume that McDonnell-Douglas probably resists the notion that the U.S. Government ought to provide some capital. I want to hear from them about that.

But, in any event, you are then going to have an agreement that, in effect, you can't undo to cover some of these situations.

I mean, you could be into this thing trying to control subcontracting arrangements, and trying to control agreement on future subsidy behavior. They have a negotiation going on.

You have McDonnell-Douglas on the one side. They need this equity, and you have the Taiwan aerospace company on the other where the government is not at the tables but behind them.

So, the Taiwan side is going to negotiate this thing out not only from a private point of view, but from a government point of view. I mean, they're going to make sure that they take care of those interests.

Now, you're sitting back here waiting until that's all finished. And then you're going to come in at the end of it.

I used to be a lawyer. Maybe, I still am, I guess. But, in any event, any good lawyer will tell you that he wants to write the contract in the early stages and negotiate it. He writes the thing out, it's all there.

Why shouldn't you be into this thing?

There are big interests involved. The health of Boeing may itself be involved in this thing. It's not only the health of McDonnell-Douglas, but the health of Boeing may also be involved. And the health of our economy is involved.

You spent the whole first part of your statement telling us what an important sector this was for the economy. I agree with that. I thought that was the terrific part of your statement, frankly.

And I thought that the part on the unfair competition out of Airbus was terrific. It wasn't until I got to the conclusions that I felt this tremendous letdown. You set the problem up and you did it nicely. And you communicated, I think, some sense of the critical and urgent nature of this problem.

Then, when we get to the recommendations, it just almost collapses. Why shouldn't you, at a minimum, be into this exchange that's now going on in order to try to shape it to protect some of these very important national interests.

MR. FARREN. Senator, I think it's important for the Commerce Department and all agencies to follow very closely how this deal proceeds. It's not within our power, and perhaps not appropriately within our role, to try to advise either party on precisely how that deal should be shaped, other than the basic principle that we don't want this to involve government subsidies.

It should be a private transaction. It's been described as an equity arrangement. It should be done on a commercial basis, and it should not involve government subsidies.

That's our view. I don't think that would come as news to any of the parties. And I think, Senator, when you were out of the hearing room, I mentioned that I have had, on a private basis, an opportunity to convey this view to Taiwan officials.

In fact, when the initial deal was announced, our Deputy Assistant Secretary for Aerospace was with the trade mission from the aerospace industry in Taiwan. And he had an opportunity to convey some of those points on the very day that the announcement was made.

SENATOR SARBANES. I take it that there's a push on the part of Taiwan to become significant suppliers of components as part of this deal. In other words, displace U.S. component suppliers.

Is that correct?

MR. FARREN. As I understand, there would be a significant amount of manufacturing that Taiwan would want to do in Taiwan.

SENATOR SARBANES. Let me ask you this question. Is this deal, even if you sit back and don't put your hands on it, which I very strongly disagree with, it significantly diminishes your ability to shape it to protect the broader national interest here.

And I think there is a broad national interest. It's very clear to me that there's a broad national interest. And, you know, when there were no subsidies, when it was on a straight competitive arrangement, we prevailed and prevailed easily.

We were very good. Our people were very good. They were very productive. They were very effective. We dominated the market. We deserved to dominate the market because we were efficient and effective, and we produced high-quality at a proper cost to dominate the market.

Now, others are coming in. They want into that market. And they're being underwritten by their governments. And we, in the end, sit here and let this happen.

I mean, we bemoan it, say it shouldn't work this way, but we don't really do anything tough in order to keep it from happening.

When this thing comes to you for review, what are you going to review it for—national security?

MR. FARREN. That's the criterion that CFIUS looks at, Senator, national security. And that's the authority given to us under the Exon-Florio provision.

SENATOR SARBANES. Do you encompass economic security as an item under national security?

MR. FARREN. That is very often the perspective that the Commerce Department brings to the discussion.

SENATOR SARBANES. It doesn't get very far within the Administration, does it?

MR. FARREN. There are some agencies that don't review things as broadly as we do.

SENATOR SARBANES. What was the Commerce Department's position on the transfer of advanced fighter plane technology to Japan.

Do you recall?

MR. FARREN. It was the Commerce Department that led the effort to get some of that agreement redefined.

SENATOR SARBANES. I take it that's a gentle way of saying that you were opposed to it or had serious reservations?

MR. FARREN. We did initially, until many aspects of it were redefined. Then, we were much more comfortable with it.

SENATOR SARBANES. That also may be the opening wedge in destroying this favorable balance of payments in the aircraft sector for the U.S. economy—not next year, not the year after, but 5, 10, you know, you're dealing with countries that have, to their credit, a long-range view. They start out and see a path, and it's way over there, and they just work toward it. Then they get there, and we're left here.

MR. FARREN. Senator, I don't disagree with you. What's on the table here is whether or not private capital will continue to be the source of developing future aircraft programs, or whether it will involve international consortiums with heavy involvements of governments and government treasuries.

And, ultimately, you're right. Twenty or thirty years down the line, what maybe at issue is whether or not the U.S. continues to be a leader in the aerospace, or has an aerospace industry.

SENATOR SARBANES. If you don't fight them, though, from the first step, it's going to happen. I'd prefer that there be no subsidies. But, you have to make it clear to them that either that's the path that's going to be followed or the U.S. is going to fight them every step of the way.

And, therefore, in effect, sustain the competitive advantage that we have.

This isn't trying to find some industry to do that with, but you can say, well, we're not sure whether this is going to be winning an industry or losing an industry. This is a winner industry that's being eroded and, in effect, undermined by what I regard as unfair underwrites from abroad.

Now, we have to do something about it. Either we have to stop the unfair underwrites, or we have to move in ourselves in a way to neutralize them. Otherwise, we're going to be taken to the cleaners.

Thank you, Mr. Chairman.

SENATOR BINGAMAN. Thank you very much.

Senator Gorton.

SENATOR GORTON. Secretary Farren, you said something in answer to the Chairman which I found surprising and disturbing. And I want to make certain that I caught you correctly.

On page six of your written testimony, you speak about our negotiations and our position with respect to negotiations with the EC over Airbus subsidies. You talk of an impasse which took the place early last year when apparently we proposed a compromise which the EC rejected.

That compromise was to drop their 45 percent ceiling on development supports to 25 percent. So, you would sign an agreement with the European Community which allowed Airbus development supports from the government to continue at a level of 25 percent.

Is that correct?

MR. FARREN. Senator, I think that would be going too far at this stage in the negotiations. In fact, what was on the table were informal proposals attempting to determine whether or not there was a range that even made a potential compromise possible.

In consultation with our industry, a range in the area of, frankly, about 20 percent was discussed. The Europeans were indicating that their development support simply could not come down below 45 percent.

That was the extent of the difference at the time under discussion.

SENATOR GORTON. In any event, you were willing to compromise with an agreement under which there remained significant development subsidies from the government.

MR. FARREN. There was a consensus between the U.S. negotiators and the U.S. private sector that, with the proper controls on the nature of that subsidy with transparency, with predictability and, ultimately, with repayment of supports, that there was a level of development support that would be acceptable.

SENATOR GORTON. So, under those circumstances, you are willing to allow or even to encourage the government of Taiwan to invest in McDonnell-Douglas and immediately thereafter begin to support developmental costs of a new jet at 20 or 25 percent?

That's a perfectly appropriate policy as far as you're concerned?

MR. FARREN. Senator, my view is that the subsidy ought to be very firmly set at zero. But, I think that, in negotiating with the European community, we've looked at a range of compromises.

SENATOR GORTON. I understand that. You've been very clear on that. But, you also went on to say that you would then want to make that multilateral, which means, presumably, that Taiwan would be permitted with our blessing to engage in a subsidy for a competing aircraft at the same level that you agreed with the EC.

Is that right?

MR. FARREN. If there is a level agreed to with the EC and we attempted to multilateralize it, then we would hope that Taiwan would sign on. And that would clearly be the level that they'd be obligating themselves to.

SENATOR GORTON. Let's make this more general than McDonnell-Douglas. It is perfectly appropriate for any American aerospace company to go and find some kind of equity agreement with a foreign country, which then can subsidize developmental costs to the extent of 20 or 25 percent, if this is your agreement with the EC.

MR. FARREN. That could be the consequence.

SENATOR GORTON. And, in exchange for that, take 70 percent of the construction business of the aircraft against the 25 or 30 percent that you've said is the rule at the present time.

MR. FARREN. That may be an element of the deal that they would want to negotiate.

SENATOR GORTON. I would suggest to you, Mr. Secretary, that that's a hell of a position to take, and I would sure recommend that it be significantly reexamined because you are just asking to send this business overseas under those circumstances, and ratifying a subsidy which, presumably, you are not going to recommend be given to development in the United States.

MR. FARREN. I would hope that we would not be in a position of needing to look to government subsidies to the U.S. industry, no.

SENATOR SARBANES. Would the Senator yield?

Do I understand that you're prepared to sign on to the proposition that other countries can—your figure is 25 percent and may be compromised out at something else—subsidize? You're going to concede that, but we're not going to do any?

Is that correct?

MR. FARREN. There is nothing on the table at this point, Senator, in terms of offering supports to the U.S. industry.

What our objective has been is to try to get the current subsidies in the European community under control.

SENATOR GORTON. What maybe a good deal if you're starting at 50 percent or 45 percent and you can only get 20, that may be a reasonably good deal. But to extend that to say that you're going to offer that to any other nonproducing foreign country that wants to engage in it, it just seems to me to be incredible.

MR. FARREN. I'm not sure, Senator, how you would choose to limit it just to the European Community and the United States, in terms of a bilateral deal, because there would be absolutely no limit on the level of subsidy that other countries could offer.

And, let me say, we haven't agreed to sign on to anything. And, frankly, I think the objective clearly still is to get the subsidies to zero. There have been compromises discussed, and discussed with our industry and with the European negotiators, that fall within these ranges.

SENATOR GORTON. I must say that I regard that as a breathtakingly bad set of ideas. But I want to ask you another question now.

What does the term "success" mean with respect to one of these GATT panels, such as you've already convened and may convene in the future?

What happens if that GATT panel agrees that our position is correct?

MR. FARREN. The GATT panel might find that the program violated the obligation of the European Community under the GATT Subsidies Code. And that would essentially call for the European Community to end the program, or authorize us to take action to compensate for the effects of that.

SENATOR GORTON. But you can already do that under 301, can't you?

MR. FARREN. It would be a unilateral action. It makes a lot more sense to try to get an agreement through GATT.

SENATOR GORTON. But it's, effectively, the ultimate sanction is the same.

MR. FARREN. It could be the same. And, obviously, the European Community has a right to block the panel decision, refuse to adopt it. Then, you can go back to GATT and look for the opportunity to seek redress unilaterally.

SENATOR GORTON. Thank you, Mr. Chairman.

SENATOR BINGAMAN. Thank you very much.

SENATOR BRYAN.

SENATOR BRYAN. Thank you very much, Mr. Chairman.

Mr. Secretary, you've outlined the negotiations that have gone on for nearly a decade to persuade the Europeans to discontinue their subsidies. And you've told us that in one instance that the President and the Vice President weighed in heavy, to use your terminology—heavy—when landing rights were used as part of a negotiating strategy to persuade the purchase of Airbus.

I think we have to acknowledge that, notwithstanding all of those efforts, that policy and that course of action has accomplished absolutely nothing to this point.

Would that be a fair characterization?

MR. FARREN. Senator, I think, in some instance, we have had some success, and it's not just landing rights. If we felt that something other than commercial or technical considerations were being brought into the decisions, then the U.S. Government weighed in and made the strong case.

SENATOR BRYAN. But the subsidies are continuing.

MR. FARREN. Subsidies to Airbus are continuing, yes, sir.

SENATOR BRYAN. Subsidies to Airbus are continuing.

Would you agree or disagree with the projections offered by the Presiding Officer here to the effect that, when you look at the trend line, Airbus's penetration into the air transport market is increasing, and increasing rather dramatically?

MR. FARREN. And it will become worse if Airbus goes ahead with launching what's been called the A-350, which would give them a full family of aircraft to compete effectively against Boeing.

SENATOR BRYAN. Irrespective of ideological constraints, wouldn't that suggest that our policy, notwithstanding its good intention, has been a failure and that we ought to be doing something else?

It hasn't worked. You've tried. We all agree that it was an effort that was worthy of undertaking but it certainly has not accomplished its objective, if the objective, as you describe it, is to persuade the Europeans to discontinue the subsidy?

MR. FARREN. We've said that we're prepared to change our course as of March 31 if these negotiations are not successful.

SENATOR BRYAN. What are you going to do on March 31?

MR. FARREN. We will be prepared to move ahead with requesting a GATT panel, and we would be prepared to entertain any action under U.S. law: countervailing duty, antidumping, or Section 301.

SENATOR BRYAN. And you have a strategy in place that on March 31 you will unveil that strategy so that we will know what it is?

MR. FARREN. Senator, as of the conclusion of the current negotiations, there will be interagency discussions, and we'll decide then just how to proceed.

SENATOR BRYAN. I guess what I find so troubling about this is that this isn't a recent problem. In 1984, you've indicated the negotiations commenced.

It seems to me that long before this point on March 31 that you ought to have a contingency plan to say: Look, if we haven't reached any success that, in terms of breaking through on the subsidy issue, we ought to be able to do this, and to say, now, we're going to convene this panel of inter-agency people in the government—this seems to me to be a rather timid response to the nature of the problem.

MR. FARREN. Senator, I've said that we've told the European negotiators, and we've consulted with our industry on the need to move ahead with the panel if we don't have a successful outcome by the 31st of March.

SENATOR BRYAN. Let me focus now on the proposed or, at least, the published report of what this agreement is supposed to involve, as we understand it. And we'll have witnesses here that fill in the gaps.

It's $2 billion. Two billion dollars is going to be offered by this Taiwanese partner to assist McDonnell-Douglas.

I think everybody here understands that there is a serious financial problem here. The best information that I've had suggested to me is that for a new launch of the magnitude of the size of the MD-12 that you'd]need either $4 or $6 billion. Some industry people tell me that it may be in excess of $10 billion.

Further, if these reports are accurate, we are led to believe that of the $2 billion, $1.5 billion is going to be used to retire current debt.

Now, whether you went to school under the old math, as I did, or as a younger man like yourself under the new math, that leaves only $500 million left, doesn't it?

Now, if the $4 billion or $6 billion or $10 billion involved—it seems to me—more than just a superficial analysis ought to suggest to us that there is more here than meets the eye.

Can you indicate whether you have any of those concerns or, indeed, at least in my own mind, they are more than concerns. They're suspicions, Mr. Secretary.

MR. FARREN. Senator, you're going to be hearing from——

SENATOR BRYAN. But I'm asking you, Mr. Secretary. You're an intelligent and informed, articulate representative of this Administration.

What's your mindset?

MR. FARREN. One, I'd hope that McDonnell-Douglas would give you some of the specifics. I understand that McDonnell-Douglas believes that through current sales and profits that they'll be able to generate sufficient funds to undertake launch.

That's something that we've been talking to them about and we would want to see more specifics as the discussions continue. And there certainly will be debate, as at the time of every launch, in terms of cost and where the potential funds will come from.

SENATOR BRYAN. I guess what troubles me about that response, Mr. Farren, is that it seems to be a pretty laid-back response. It seems to me that all of us ought to be concerned.

As Senator Sarbanes indicated, I thought the statement of the magnitude of this industry and its importance to us was very well laid-out. It seems to me that somebody ought to be energized, rather than saying, well, we'll just take a look and see what the private sector wants.

Have you expressed to the Administration privately, indirectly to McDonnell-Douglas, saying: Look, we have some concerns that these numbers that have been reported, the $2 billion, the $1.5 billion to retire

to debt, the cost of a new launch being in the multibillion dollar range, this deal doesn't quite look like it smells right to us?

Has anybody expressed that concern? Or, is there to be no private communication at all?

MR. FARREN. No. We've been discussing with the industry, as I indicated, and informally with some Taiwan officials, the nature of the public announcements on this. And we'll continue to do so.

SENATOR BRYAN. And have you, Mr. Farren, said: Look, how does this deal work out? If $1.5 billion of the infusion of capital is to retire old debt, how does that help you get the launch of the MD-12 off the ground?

Have you shared those concerns?

MR. FARREN. We have not gone in with a detailed critique of the proposal as it's been publicly reported, no, Senator.

SENATOR BRYAN. Just one last series of questions, Mr. Chairman, and I appreciate your patience here in indulging me.

Let me just see if I understand where the Administration may be coming from.

If there was an American private-sector joint venture that came forward, would you be much more comfortable with that than you would the Taiwanese joint venture?

Or, does it make any difference to the Administration?

MR. FARREN. You have to be very careful on that point because we have a strong commitment to an open investment policy.

SENATOR BRYAN. I understand that. But I'm asking in terms of comfort. Certainly, everybody in this room would think that somebody ought to have some concern—perhaps not to the extent that some of us have—but there's sure as hell some risks that are involved to a premier industry in this country.

If the choice were an American private-sector partner versus a Taiwanese, wouldn't you be more comfortable as an American to have one of our people in the cockpit with McDonnell-Douglas, rather than a foreign manufacturer with government ties that may just possibly lead to the specific Airbus problem that some of us worry about?

Would you be more comfortable?

MR. FARREN. Senator, if there was an American corporation negotiating with McDonnell-Douglas, I wouldn't be sitting here.

SENATOR BRYAN. Would you be more comfortable? I just want to know where you all basically are coming from.

MR. FARREN. There would not be as many questions in terms of the implications of the transactions. Certainly, to that extent, if you want to say that I'd be more comfortable, yes, Senator.

SENATOR BRYAN. In terms of analyzing just superficially, does it suggest itself to you that, if there is not an American private-sector partner that wants to come in, they've analyzed these numbers with the kind of sophistication that people in the private sector have, that they have chosen for some reason not to participate, that leads me to the conclusion that,

again, this agreement that's being contemplated has more to it than meets the eye. Does that thought occur to you?

MR. FARREN. Senator, I draw a different conclusion as to why there isn't U.S. private capital rushing to McDonnell-Douglas's door. I draw the conclusion that the true effect of Airbus subsidies is finally coming home to roost. And you see a U.S. manufacturer unable to go out and raise the private capital in the U.S. capital markets and needing to go to foreign capital. And perhaps foreign capital that is offered through some form of guarantee from a public treasury.

There, again, I think we have to go back to the root cause of that. It's the fact that four European government treasuries have been opened up to Airbus. And those deep pockets make U.S. private-sector investors, unfortunately, leery of investing in our own industry.

SENATOR BRYAN. Mr. Secretary, if you and the Administration would be more comfortable with an American private sector partner—you've indicated you wouldn't be here today if that were the case—what role, if any, do you think that the Administration ought to undertake in terms of trying to facilitate, trying to encourage and to perhaps serve as some type of an unofficial broker to see if there are people out there?

I'm not suggesting, of course, a strategy, but to try to reach out there to try and see if that might come to fruition. Or, do you see yourself as having a role?

MR. FARREN. Senator, we have a role. And the reason I'm here and we have concerns is that you have to look at the national security implications and the broader implications for the manufacturing base.

If you start talking about the government, though, playing the role of an investment broker in order to maintain equity of American origin—having been at the Commerce Department since 1983—I've seen foreign governments take on that broker role with very perverse effects—perverse effects for U.S. industry and their own manufacturing base. And I'm reluctant to say that it's time for us to become a broker.

SENATOR BRYAN. But if it led to the success and survival of an important American manufacturer—McDonnell-Douglas—wouldn't that be at least worth attempting to see if that could be arranged? I'm not talking now about financial participation by the government. That's a separate issue.

MR. FARREN. I think the survival of McDonnell-Douglas in the U.S. aerospace industry is a vital government concern. And I think one reason why many will take a position that the Taiwan offer of an equity investment makes sense is precisely on that basis, and that it's one means of ensuring that McDonnell-Douglas continues to be able to develop new aircraft.

That's part of the irony that we'll all confront with a problem that is rooted in European subsidies, not in the issue of Taiwan, or the capacity of McDonnell-Douglas to build commercially viable aircraft.

SENATOR BRYAN. Mr. Secretary, if you look at the track record—and you'll acknowledge that it has not been good in terms of this subsidy

issue, assuming for the sake of argument that, notwithstanding the representations that are being made, there's not going to be any government subsidy by the Taiwanese government; let's just assume for the sake of argument that the deal is struck, that it's approved and that, indeed, sometime thereafter that there is Taiwanese government participation and it is a substantial subsidy. Wouldn't you agree that, based upon the history of our negotiations in trying to reduce or eliminate those subsidies, there's not a whole lot of comfort that members of the Congress ought to have, or those in the industry who compete without benefit of a subsidy would have, in trying to arrest or to eliminate that?

MR. FARREN. Senator, as a matter of trade policy, that would be one of the leading concerns that Commerce and USTR bring to the table without a multilateral agreement that eliminates or limits subsidies. You always run that risk. And that's a problem.

SENATOR BRYAN. I don't want to belabor the point, Mr. Secretary. That's been your policy since 1984. The reason that you outline that it has not been successful, now that we have 34 percent of the back-order in Airbus on the books—it just seems to me that that doesn't really respond to the nature of the concern.

I thank you very much, Mr. Chairman.

SENATOR BINGAMAN. Thank you.

Mr. Secretary, could I just ask one additional question here to be sure I understand?

The position of a lot of folks here on the panel, as I'm sure you're clear, is that we should not permit foreign government subsidy of aircraft manufacturers that our own industry has to compete with. And I gather that's Boeing's position. They do not want to see that.

The Administration's position though, as I understand it, is different. The Administration's position is that that is your preference, is that there be no foreign government subsidy, but in the case of Airbus, we may well have to agree to allow a certain 20-25 percent developmental subsidy.

If we do, then, clearly, what's fair for the goose is fair for the gander. And if it's OK for the Europeans, it would be OK for Taiwan.

So, the Administration's position is that, while we don't like it, we would not have any basis for objecting to a 20-25 percent, or whatever the figure is that we work out with the Europeans on some level of developmental subsidy provided by the government of Taiwan.

MR. FARREN. Mr. Chairman, first of all, let me say that throughout these negotiations, I can't think of any instance where there was a difference of opinion between the negotiators on the U.S. Government side and the U.S. industry. I just can't think of one.

Frankly, if there was ever a difference of opinion, it was U.S. negotiators, myself being one, so I can speak for myself, being considerably more aggressive than the U.S. industry was.

SENATOR BINGAMAN. You are saying U.S. industry agrees with this position, but has just not articulated it?

MR. FARREN. Mr. Chairman, since they're here, I'll give them the benefit of speaking for themselves. But I can say, throughout the negotiations, I don't know of any fundamental difference, particularly in terms of proposals being offered between the U.S. industry and U.S. negotiators.

I can also say that what was referenced in my written testimony of potential compromises discussed doesn't go to our fundamental objective, which is to eliminate subsidies.

The problem with Airbus, it becomes too natural a model for the European community to follow and other industries. They've tried it in the electronics industry. We can be thankful that, thus far, they've failed in those industries.

SENATOR BINGAMAN. I'm not focusing on what our objective is. I understand our objective is to eliminate subsidies.

But there is a difference between what our objective is and what it would appear that we might be willing to settle for.

I understand you to be saying today that we might be willing to settle for a level of developmental subsidy in the case of Airbus, which would follow in the case of Taiwan as well.

MR. FARREN. We have—we being the U.S. Government—after consultations with the U.S. industry, discussed with the European Community potential comprises that allow for a subsidy above zero.

SENATOR BINGAMAN. So, then, Boeing would be the only major manufacturer, if this deal went through and all of this were to occur, that did not have a direct government developmental subsidy?

MR. FARREN. For now, right.

SENATOR BINGAMAN. We have five additional witnesses. If other members of the panel can withhold, I would propose ... do you have a burning question? Go right ahead.

SENATOR SARBANES. I want to make one observation. Then, I want to ask one question, Mr. Chairman.

Mr. Farren, I just make this observation. The fact that negotiators may take a position which you characterized as harder than that of U.S. industry does not necessarily mean that the U.S. national interest is being served, because the national interest may, in fact, call for you to take an even harder position.

When you say "U.S. industry," I take it that you're referring to management. Management can produce a bottom-line profit that is good in the narrow context of their private interest by shifting some of this production overseas by entering into these arrangements from a narrow company point of view, in terms of showing a profit.

They may come out ahead from the U.S. interests, in terms of production here at home, in terms of the workers and jobs—American jobs—and in terms of being on the cutting edge of technology, and in terms of producing a trade surplus in the overall U.S. balance of payments, we may come out well behind in all of that.

So, I don't think your position that you assert necessarily carries with it the validity you imply simply because, as you say, the U.S. industry was, I take it, in agreement with it.

And I want to make that point very strongly because what is happening, of course—and it's not only happening in this industry, it's happening in other industries as well—from the narrow company's point of view, they may, in fact, show a better bottom line by sending their production overseas, but that, nevertheless, ends up in a very real sense being potentially harmful to the national interest, in terms of American interest, in terms of American balance of payments.

Now, the question I wanted to put to you: Are you the point man in the Administration on this issue?

MR. FARREN. Myself and the Deputy U.S. Trade Representative have been serving as the two key negotiators. Up until last year, it was Lynn Williams. After his resignation, Michael Moscow.

SENATOR SARBANES. You have a lot of responsibilities. How much of your time and effort would you estimate you spend focusing on the issue that is the subject of this hearing?

MR. FARREN. It varies. Last week, I spent probably a day and a half on it, with the Europeans in town. It varies with the cycle of the negotiations. But a considerable amount of time.

Senator, if you'll give me a second, I don't disagree with your point that you can't assume that the corporate interest parallels the national interest. That's precisely why the Administration comes to the table with a much different view very often than management officials that we talk to.

It's why, contrary to popular belief, the Commerce Department will often end up in conflict with industries, because we view the national interest differently.

The Chairman referenced the President's comment before his Asian trip by saying that his objective was "Jobs, jobs, jobs." And I think, fundamentally, that's our perspective.

It's not "Profits, profits, profits."

SENATOR BOND. Mr. Chairman.

SENATOR BINGAMAN. Senator Bond.

SENATOR BOND. Mr. Chairman, there's been a lot of water over the dam since I last spoke. And I think, just to clarify a couple of things, I will take less than 90 seconds. I want to say, number, one, that one of the reasons why McDonnell-Douglas looks for an Asian partner is the same reason that other commercial aircraft producers look for overseas partners to produce. And that is that's one way you get into the market. If you have totally American production, you're going to have a lot more difficulty selling in competition with Boeing, for example, which has an Asian partner.

So, there is a very logical business reason to have overseas production throughout the aircraft industry that exists.

Number two, with respect to the subsidies, I strongly agree with the points expressed around here that we ought not to be agreeing to a 25 percent subsidy.

But there was an implication that I'm afraid might be misinterpreted, and that is, if we did agree to a bilateral agreement to permit Airbus to subsidize up to 25 percent, that that, in fact, would permit, or encourage, or somehow allow the Taiwan business interests—not Taiwan Aerospace, which is not going to be the investor, but the Taiwan business interests—to somehow gain a government subsidy.

If you had such a bilateral agreement that became a multi-lateral agreement, then Japanese interests would be just as able to provide a subsidy through their co-production with the other companies as would McDonnell-Douglas.

I would like your confirmation of that.

And the other point that, as you said earlier, you do not view this as a subsidy but as an equity investment. You have the ability to determine whether there is an equity investment or a subsidy. The view of the Commerce Department is that this must not go forward as a subsidy, an ongoing subsidy, as opposed to an equity investment.

MR. FARREN. First of all, Senator, it is very difficult, and part of our problem in negotiating with the Europeans is trying to draw a distinction between subsidies and equity investments. So, that can be very difficult to do. Money is fungible. I agree with you, everybody is looking toward Asia for investment. To the extent that it's private equity investment, we're all for it. In fact, Airbus is looking to Asia for investment.

One, because they want the markets; and, two, because that's where the money is. We've talked about the strong financial position of Taiwan.

Finally, on the subsidies, we would be against any government subsidy in this deal or any deal. And let me correct a misimpression, perhaps.

One thing we would hope to do in the multilateralizing in a U.S./EC agreement on Airbus is to have some arrangement to basically ring out subsidies over time.

In fact, one of the proposals that was on the table was, when you bilateralize, you allow a level of subsidy. Once you multilateralize, you start moving that acceptable subsidy level down and, hopefully, that would give the Europeans some inducement to do precisely that, frankly, to prevent other countries from effectively subsidizing the creation of an industry.

So, by no means would I say an agreement will automatically create a situation where foreign governments had an open checkbook available to subsidize the industry.

Senator, did I cover all the points?

SENATOR BOND. Thank you, Mr. Secretary.

SENATOR BINGAMAN. Thank you very much, Mr. Farren. That has been very useful testimony.

I'd ask that we have two other witnesses come forward right now on this next panel; Lawrence Clarkson, who is vice president for Planning

and International Development for the Boeing Company; and Laura Tyson, professor of Economics and Business Administration at the University of California, Berkeley. Laura is accompanied by Pei-Hsiung Chin—the co-author of a chapter on the commercial aircraft industry in her forthcoming book, *Who's Bashing Whom: Trade Conflict in High-Technology Industries.*

Mr. Clarkson, thank you very much. You've been very patient. All of the witnesses have been very patient as we've asked our questions.

Why don't you go right ahead with your testimony.

Thank you for being here.

Let me just say, with all the witnesses here at the first, we're going to try here with our panel to limit our questions to 6 minutes each for future panels, so we can give all the witnesses a chance to speak.

We would appreciate it if the witnesses would also try to summarize their main points so that we can get on to those questions.

Mr. Clarkson, please proceed.

STATEMENT OF LAWRENCE W. CLARKSON, VICE PRESIDENT FOR PLANNING AND INTERNATIONAL DEVELOPMENT, THE BOEING COMPANY

MR. CLARKSON. Thank you very much, Mr. Chairman. I am Larry Clarkson, Boeing's vice president for Planning and International Development.

I wish to commend the Committee for holding these important hearings and for inviting Boeing to participate.

Let me state at the outset that Boeing welcomes fair competition and does not oppose investment in McDonnell-Douglas Corporation by the Taiwan Aerospace Company, provided that the new structure assures that there can be no subsidies by the Taiwan government and that their provisions to require disclosure is sufficient to monitor and verify compliance with this requirement.

Published reports indicate that McDonnell-Douglas Corporation [MDC] proposes to sell 40 percent of its commercial airplane operation to Taiwan Aerospace Company [TAC] for about $2 billion. Another 9 percent will be sold to other Asian investors, with MDC retaining just over 50 percent ownership and control, and, we would note, with no room left to raise additional funds through the sale of equity, without relinquishing that control. MDC indicates that $1.5 billion of the TAC investment will be used to pay down current debt.

This arrangement purportedly will allow MDC to launch the MD-12 in competition with our 747. MDC would assume the role of designer, final assembler and marketer of the MD-12, with the bulk of manufacturing slated for Taiwan and other Asian partners or subcontractors.

The media report that total support required for the MD-12 program to be in the $4.0 to $5.4 billion range—this actually only reports the development costs for certification—while industry analysts estimate that

requirement to be in the $7-10 billion range. While accurate estimates cannot be pinned down until the MD-12 is fully defined, we are, nevertheless, able to make "educated estimates" which correlate well with that of the analysts.

A major aircraft program of this type requires significant up-front investment in training, facilities, tooling, equipment, inventory build-up and, of course, design and development. Total program cumulative negative cash flow for a typical aircraft program of this size would likely be on the order of $10 billion or more around the fifth year after go-ahead. And this assumes a typical successful program. Were market conditions to deteriorate, these numbers could even increase. Obviously, large cash infusions will be required. And where then will they come from? And under what terms and conditions?

We know the Taiwan government has announced the intent to establish a commercial aerospace industry where none now exists, and to support it through funding, tax benefits and other forms of subsidy. Further, Taiwanese currency reserves, much of it from trade with the U.S., were recently reported at $82 billion [USD]. This certainly provides them with the required bankroll.

In August of 1990, Taiwan released its "China Aeronautics and Space Industries Development Program." That program provides an outline of how Taiwan plans to target development of a domestic aerospace industry.

The program includes a number of potentially troublesome measures, including low-cost financing from the government through the Development Bank of Taiwan, the Bank of Communications and other designated financial institutions; technical and financial support from the Ministry of National Defense; establishment of an Aeronautics and Space Industrial Park to provide industrial land and necessary facilities required for the development of the industry; and tax benefits. This plan outlines a wide range of means by which their new commercial aerospace industry could be supported.

But international and domestic law in this area is quite clear. A subsidy can take many forms, ranging from government guarantees that allow funds to be allocated to firms and industries that are otherwise not creditworthy or equityworthy to government-directed credit allocation policies that funnel private resources into sectors or industries designated by the government as a high priority.

As a matter of fact, Mr. David Huang, chairman of TAC, is quoted in the *Far Eastern Economic Review* as saying that, "the Taiwan government would continue to invest in TAC until it makes a profit."

What would this mean to Boeing and the aerospace industry infrastructure in the United States? The past 21 years have amply illustrated the impact that government subsidies and sales inducements can have on the commercial airplane market. Purely commercial enterprises have suffered due to the market distortions caused by such subsidies and inducements.

Airbus has consistently gained market share against non-subsidized enterprises like McDonnell-Douglas. Another subsidized manufacturer, located in Asia, will significantly increase market distortion and significantly disadvantage companies like Boeing that must rely on traditional commercial means of supporting development and sales.

The market for large subsonic jet transports over which the three present-day manufacturers are competing is one in which Boeing has been successful and that has been a significant contributor and benefactor to the United States of America. The manufacturer of commercial airplanes supports some 2 million direct and indirect jobs nationwide. In 1990, export of commercial jets amounted to about $17 billion U.S. dollars. Boeing accounted for 80 percent of that, making us America's leading exporter for the past 2 years.

Obviously, both Boeing and America have much to lose if an Asian Airbus is allowed to enter the marketplace.

Mr. Chairman, as you are aware, Taiwan is not bound by trade disciplines that govern aerospace manufacturers in the United States and abroad. As a consequence, Taiwan could engage in any number of trade-distorting measures that could place us at a severe competitive disadvantage.

In this context, it is our view that the U.S. Government needs to act upon these matters. There are several approaches that we recommend.

One option is that the U.S. Government should negotiate now a bilateral agreement with Taiwan that would prevent the use of unchecked government subsidies and other trade-distorting measures to develop an aerospace industry. This agreement should include a provision for adequate transparency to ensure compliance with the agreement.

In conjunction with the CFIUS review process, the U.S. Government should examine the sources of the funds and the ultimate financial requirements of the venture. Under the CFIUS process, the U.S. Government could condition its approval of the MDC-Taiwan Aerospace venture on a commitment by MDC and Taiwan that the venture would not be subsidized or supported in a manner that contravenes international and domestic law governing aerospace trade. Again, appropriate transparency provisions are a key to a successful monitoring and enforcement of this commitment.

I guess what we're saying there is that we're asking McDonnell-Douglas and the government of Taiwan to make a binding commitment to what they already say will be the case.

Finally, it is our view that the appropriate time for the U.S. Government to take this recommended action is now. Surely, an undisciplined venture in the Far East will serve to jeopardize the U.S. Government efforts, to date only partially successful, of negotiating an agreement on Airbus industry subsidization practices. Once the MDC-TAC transaction is consummated, our ability to address subsidies and other trade-distorting measures is extremely limited. It will be a U.S. company. You won't be able to use 301. You won't be able to use countervailing duties.

Mr. Chairman, this approach must be coupled with a redoubled effort to discipline Airbus subsidies. Twenty-one years of subsidies, which has resulted in a dramatic increase in market share at the expense of the United States manufacturers, is enough. Our ability to create high-paying jobs, to sustain economic growth, and to develop and commercialize new products depends upon an environment free of subsidies, across both the Atlantic and the Pacific.

I'd also like to just comment briefly on Boeing's relationship with Japan because I think it's been greatly distorted.

We do have a relationship with three companies in Japan: Mitsubishi Heavy Industries, Kawasaki Heavy Industries and Fuji Heavy Industries. They make, for example, 15 percent of the 767 airframe. But, in fact, that's 7 percent of the airplane for which Boeing is totally responsible. On the 777, you've heard the number of 20 percent of the airframe. In fact, that's 9 percent of the airplane that Boeing is responsible for.

The funding that these companies receive is limited to some benefits related to R&D and has been greatly overstated. So, far, for the 767, $78.1 million has been the benefit that the Japanese industry has received in the way of loans. Three-quarters of that has been repaid. Under the 777 program, the number is $6.2 million, not the hundreds of millions or billions of dollars that have been estimated.

On the other hand, the price paid by Boeing to the Japanese companies, which were essentially subcontractors, is the same that we would pay either to a U.S. supplier or would be our own costs. There's no benefit of even this limited funding flowing through to Boeing.

On the other hand, Japan is our largest single overseas customer. Japan Airlines is our largest customer for the 747. All-Nippon Airways is our largest customer for the 767.

Clearly, this Japanese involvement has allowed market access. We're able to show, and I'll be happy to give you the data for the record, that for every job we have exported to Japan, we have created over 22 jobs in the United States.

We are very sensitive about exporting jobs. Total foreign content in all of our present airplanes is just over 5 percent. In fact, we have 3,000 suppliers; less than 10 percent of them are overseas. The other 90 plus percent of them are here in the good, old USA.

We have very carefully limited the technology that we've allowed to be transferred to Japan. We've also limited their ability to use that technology, to the extent that we can, consistent with U.S. antitrust laws.

We did propose to have a joint venture with Japan in 1987 on a program called the 7J7 that would have set up a joint venture where we would have owned 75 percent of the program, and they would have had 25 percent.

That program has not gone ahead. Maybe, at sometime in the future, because of the globalization of the industry, we will have a joint venture. But, we have no proposals nor would we contemplate any where we would sell part of our commercial business to anyone.

Thank you very much.

[The prepared statement of Mr. Clarkson follows:]

PREPARED STATEMENT OF LAWRENCE W. CLARKSON

Good morning, I am Larry Clarkson, Boeing Vice President for Planning and International Development. I wish to commend the Committee for holding these important hearings and for inviting Boeing to participate.

Let me state at the outset that Boeing does not oppose investment in McDonnell Douglas Corporation (MDC) by the Taiwan Aerospace Company (TAC) provided that the new structure assures there can be no subsidies by the Taiwan government, and that there are provisions to require disclosure sufficient to monitor and verify compliance with this requirement.

Our testimony today is based on the belief that, if their proposed arrangement is consummated under terms currently reported in the media, it will create another subsidized airplane manufacturer, an Asian Airbus, -- leaving Boeing as the only remaining major civil aircraft manufacturer bound by traditional open-market, profit and loss constraints.

Published reports indicate McDonnell Douglas Corporation (MDC) proposes to sell 40% of its commercial airplane operation to Taiwan Aerospace Company (TAC) for about $2.0 billion (USD). Another 9% will be sold to other Asian countries, with MDC retaining just over 50% ownership and, we would note, no room left to raise additional funds through the sale of equity, without relinquishing that control. MDC indicates $1.5 billion of the TAC investment will be used to pay down current debt.

Launch of the MD-12 trijet will target a market niche between Boeing's new 777 twinjet (which delivers beginning in 1995) and the 747-400 (4-jet, which is being delivered today). Though smaller, the Airbus A330 (twinjet) and A340 (4-jet) will also be competitors which deliver beginning in 1993. The MD-12 is currently scheduled to deliver beginning in 1997.

The current global market slowdown for commercial aircraft is likely to continue for several years. According to Wall Street analysts, total annual demand for new aircraft deliveries (based on projected air traffic passenger growth and replacement of aging aircraft is not

traffic passenger growth and replacement of aging aircraft) is not likely to exceed 600 airplanes per year for the next decade. Boeing generally agrees with this assessment. Current world production capacity is already about 1,000 airplanes per year, and climbing. with the end of both the Gulf War and the Cold War, and the significant reduction of military budgets virtually world-wide, the aerospace industry is trying wherever possible to shift its emphasis from military to commercial aircraft. By decade end this trend is only going to add to the world's excess capacity. It is in just this market environment that we would expect a subsidized competitor to employ sales incentives (which undermine realistic pricing), to secure increased market share at the expense of its American competitors.

Yet for Boeing and the American commercial airplane industry, an open global marketplace, free of such trade distortions, is crucial for continued success. Such foreign subsidies and other market-inhibiting policies not only introduce unwanted economic and trade distortions, but make us less competitive in the process, even when we've become more efficient. Clearly this is a Boeing perspective, driven by our worldwide market outlook. And, while it would be naive to expect trade protections (including those in our own country) to all disappear overnight, I believe it's worthwhile exploring the impacts on our industry when trade is artificially distorted.

The mechanisms by which subsidies and other protectionist measures artificially alter market activity are relatively well understood. Subsidized ventures tend to lack the fiscal imperative which leads to sound commercial decisions, instead often introducing products to win market position, rather than earn a profit. They can remain in money-losing markets when it is, economically, poor business. They can inhibit the entry of a non-subsidized competitor into a market, or worse, split a market so that no one can earn a profit. Subsidy can also take the form of government support in the sales process. A manufacturer which can rely on government backed financing at favorable rates is in a much stronger position than a company which must rely solely upon private sector resources. This is particularly true in a recession (such as the current one) when the typical cash-shy customer seeks any assistance available and may be forced to make purchasing decisions based on financial incentives.

For the commercial airplane manufacturing industry, subsidies and other government interference in the market place also have long lasting effects. The decision to buy a particular airplane model typically commits the buyer to a relationship with the manufacturer for 10 or 20 years. And, given its large investment in inventory and training, coupled with the value of commonality, the airplane is likely to give that manufacturer an edge when more or different airplanes are needed. Thus, even a small sale can be perpetuated into a long-term fleet decision, a legacy of the original decision.

Commercial airplane programs require the manufacturer to make an enormous front-end investment. And they recover that investment and make a profit, if any, only after a long period. American manufacturers have traditionally been required to finance such multi-billion dollar airplane programs out of internally generated profits, or from available commercial market sources. Furthermore, a family of such airplane programs is today essential to succeed in the marketplace. So, it is in this context, that direct government subsidies in airplane development and financing may be seen to exert such powerful distortions, not only in our industry, but upon our nation's trade balance as well.

MDC indicate they intend to use about $1.5 billion of the "initial Taiwanese downpayment" for debt service with the remainder to be devoted to the MD-12 program. And, we are told that, effective January 1,1992, MDC has separated their commercial aircraft business from all military programs in response to concerns over military security and technology transfer.

The media report MDC estimates of total required investment for the MD-12 program in the $4.0 to $5.4 billion USD range, while industry analysts estimate that requirement in the $7.0 to $10.0 billion range. While accurate estimates cannot be pinned down until the MD-12X is fully defined, we are nevertheless able to make "educated estimates" which correlate well with that of the analysts. A major aircraft program of this type requires significant up-front investments in training, facilities (U. S. and overseas), tooling equipment, inventory buildup and, of course, design and development. Total program cumulative negative cash-flow, for a typical aircraft program of this size, would likely be on the order of $10.0 billion or more around the fifth year after go-ahead. And this assumes a typically <u>successful</u> program. Were market conditions to deteriorate, those numbers

could easily increase. Obviously large cash supports or subsidies will then be required. And where will they come from? And, under what terms and conditions?

At this point, Taiwan Aerospace is a newly-formed Taiwanese corporation "waiting for a role". The extent of government investment in, and control over, TAC is unclear at this time, since only a small portion of total expected funding is yet in place or committed. Original announcements of the proposed arrangement indicated TAC comprised 29% government ownership and 71% private-sector ownership. However, industry analysts have since pointed out that the private sector is "holding back", and they now estimate eventual government investment in the 60% to 85% range.

We do know, however, that the Taiwan government has announced its intent to establish a commercial aerospace industry where none now exists, and to support it through funding, tax benefits, and other forms of subsidy. Further, Taiwanese foreign currency reserves, much of it from trade with the USA, were recently reported as $82.0 billion (USD). This provides them with adequate currency resources to "bankroll" a new commercial aerospace industry should it become necessary.

In August of 1990, the Taiwan government announced its CASID (China Aeronautics & Space Industries Development) Program.* The objectives of the program are to further the development of aeronautics and space industries, and relevant parts and components industries, to stimulate parallel development of associated industries, to upgrade the domestic technology levels, and to integrate "with national defense industries in order to establish an integral aeronautics and space industry in the Republic of China".

Thus the aviation industry has been identified and targeted as one of the key industries by the Taiwanese government to:

1) Upgrade the overall Taiwanese industrial base.
2) Build a high quality work force for high value added products.
3) Conform to the trend of globalization.

* Published August 15, 1990 by the Ministry of Economic Affairs, per its Public Notice No. Ching (79) Kung 040484.

In pursuing these objectives Taiwan will emphasize international cooperation through government support. One of its explicit development strategies is "to make effective use of reciprocal amenity terms and conditions in connection with industrial cooperation arrangements in encouraging prominent foreign aeronautics and space companies and parts manufacturers to make a presence in the ROC through participation in cooperative projects, so as to facilitate the transfer of advanced technologies into this country, as well as expand the export of the products". So, in this context, it is quite clear that technology transfer is a goal of their program.

As we look further at the Taiwanese plan of implementation, we can identify at least five components which might prove potentially troublesome:

1) First, the Ministry of National Defense "will be authorized to use its operation funds, technical personnel, technology and equipment without jeopardizing principal missions, to assist government-owned and private-owned enterprises in the development and research of the manufacturing techniques of aeronautics and space products and their associated equipment so as to help those enterprises to upgrade the level of their technical capability in the field of aerospace industries" (Section IV.4 (1)).

2) Second, the Ministry of Economic Affairs has committed to "work out a plan for establishing an aeronautics and space industrial park at an appropriate place to provide industrial land and necessary facilities required for the development of aeronautics and space industries" (Section IV.6).

3) Third, investment in aeronautics and space industries "may be designated by the Government as important technology-based enterprises, and thus eligible for tax benefits" (Section IV.9 (1)).

4) Fourth, "the Development fund of the Executive Yuan, the Bank of Communications and/or other designated financial institutions may formulate a budget for

participation in, or providing low interest credit facilities to such investment plans" (Section IV.9 (2)).

5) Finally, Taiwan has incentivized the airlines to request offsets of up to 20 percent of the value of a procurement through the offer of preferential financing linked to the level of offset.

The Plan outlines a wide range of means whereby their new commercial aerospace industry could be supported -- going well beyond what some might define as a traditional subsidy. But international and domestic law in this area is quite clear. A subsidy can take many forms, ranging from government guarantees that allow funds to be allocated to firms and industries that are not "creditworthy" or "equityworthy", to government-directed credit allocation policies that funnel "private" resources into sectors or industries designated by that government as having high priority.

We would also take note of recent public comments by Taiwan Aerospace executives which tends to confirm and support our concerns. Among these are the following:

From Dr. Denny Ko, President of Taiwan Aerospace Company:

* "We can continue to go back to government related banks or institutions for financing help if a proposed project is attractive" (Wall Street Journal - November 18, 1992).

* "Taiwan Aerospace is aiming to become the linchpin between local industry, ROC government programs and foreign aerospace companies, to service the needs of both global and domestic markets" (Flight International - December 4-10, 1991).

* "This will be the Airbus of Asia. Airbus has taken care of Europe, but these is no Asian entity" (Flight International - December 4-10, 1991).

From Dr. David Huang, Chairman of Taiwan Aerospace Company, who was quoted in a speech given in late December, 1991 as saying:

* The Taiwan Government would "continue to invest in TAC until it makes a profit" (Far Eastern Economic Review, - February 13, 1992).

The latter quote has reportedly angered Taiwanese legislators to the extent that they are now demanding final say over any investment in the MDC-TAC venture that the government decides to make.

In assessing the proposed arrangement then, Boeing's concern is not that McDonnell Douglas will continue as a competitor, or that other commercially funded and managed companies join them in competing in the marketplace.

Rather we are concerned that the government of Taiwan will undertake a significant role in this new enterprise and, that the result will reflect a commitment by Taiwan, a non-GATT signatory, to finance its entry into the world commercial aircraft industry on a non-commercial basis. In essence, a new, heavily subsidized Asian competitor will be in position to substitute its national imperative of developing factories and high value-added jobs, and acquiring high-technology to upgrade its industrial base, in place of the normal imperatives driven by sound product development and tight fiscal management.

While MDC has recently separated its military functions and products from its commercial airplane organization, we see no comparable separation of these functions in Taiwan Aerospace. As we understand it, both military and commercial functions will be encompassed within TAC and, while we assume that MDC will act responsibly to control and minimize technology transfer, we should not be naive regarding Taiwan's CASID program with its stated objective of acquiring technology transfer. Mr. David Huang, TAC's Chairman, once served as the President of the Taiwan Military Research Laboratory, and is now an advisor to Taiwan's Premier, Hau Pei-tsun, himself a Taiwanese General and former chief of their General Staff as recently as 1989. This hardly describes a tidy separation of military and commercial ties.

What are the implications of the foregoing to Boeing and the aerospace industry infrastructure in the United States? The past 21 years have amply illustrated the impact that government subsidies

and sales inducements can have on the commercial market. Purely commercial enterprises have suffered due to the market distortions caused by the impact of such subsidies and inducements. Airbus, a subsidized enterprise, has consistently gained market share against non-subsidized enterprises, most notably against McDonnell Douglas. If this were not the case, would we today be addressing a proposal whereby MDC will be essentially phasing out the manufacture of commercial aircraft, - and transferring that function overseas? Yet, another subsidized manufacturer, located in Asia, will increase market distortions and significantly disadvantage companies like Boeing which must rely on traditional means of supporting development and sales.

The market for large commercial subsonic jet transports, over which the three present-day manufacturers are competing, is one in which Boeing has been successful, and which has made significant contribution and benefit to the United States. The manufacture of commercial airplanes supports some two million direct and indirect jobs nationwide. In 1990, the export of commercial jets amounted to about $17 billion USD. Boeing accounted for about 80% of that, making us America's leading exporter for the past two years. Obviously, both Boeing and America have much to lose if an Asian Airbus is allowed to enter the marketplace.

Mr. Chairman, as you are aware, Taiwan is not bound by trade disciplines that govern aerospace manufacture in the United States and abroad. Taiwan is not a member of the GATT and has not taken on the obligations of the GATT Civil Aircraft Agreement. Furthermore, it is not bound by those OECD rules limiting subsidized export financing. As a consequence, Taiwan could engage in any number of trade distorting measures that could place us at a severe competitive disadvantage in U. S. and foreign markets.

In this context it is our view that the U. S. Government needs to act upon these matters. There are several approaches which we recommend be followed to assure that government subsidies, sales inducements and other means of governmental interference in the marketplace do not become part of the proposed MDC-Taiwan Aerospace business arrangement.

One option is that the U. S. government should negotiate now a bilateral agreement with Taiwan that would prevent the use of unchecked government subsidies and other trade-distorting measures to develop an aerospace industry. This agreement should include a provision for adequate transparency to ensure compliance with this agreement.

In conjunction with the CFIUS review process, the U. S. Government should examine the sources of funds and the ultimate financial requirements of the venture. The U. S. G. could condition its approval of the MDC-Taiwan venture under the CFIUS process on a commitment by MDC and Taiwan that the venture would not be subsidized or supported in a manner that contravenes international and domestic law governing aerospace trade. Again, appropriate transparency provisions are key to the successful monitoring and enforcement of such a commitment.

Finally, it is our view that the appropriate time for the U. S. Government to take the recommended action is now. Surely an undisciplined venture in the Far East will serve to jeopardize the USG's effort, to date only partially successful, of negotiating an agreement concerning Airbus Industrie subsidization practices.

Government subsidies are among the most serious long-term threats facing out jet transport industry today. The Airbus example is a clear demonstration of the damaging impact that subsidies have on the marketplace, and the extreme difficulty in addressing the problem once there has been a significant political and/or financial investment devoted to the creation of programs, facilities, equipment and jobs, -- and to the acquisition of technology. In the Taiwanese case, we are considering an arrangement with a country with which the U. S. had a $13.0 billion trade deficit in 1989, and a $11.2 billion deficit in 1990.

Further, unlike the situation with Airbus, once the MDC-TAC transaction is consummated, our ability to address subsidies and other trade distorting measures is extremely limited. Because the MDC-TAC venture is 50% American owned, we could not initiate a countervailing duty investigation, bring a GATT case, or file a section 301 case. So, in our view, the matter must be addressed, the ground-rules agreed, and the recommended provisions put in place at this time, not after it becomes "fait accompli".

Mr. Chairman, this approach must be coupled with a redoubled effort to discipline Airbus subsidization policies. Twenty one years of subsidies, -- which has resulted in a dramatic increase in market share at the expense of U. S. manufacturers -- is enough. Our ability to create high paying jobs, to sustain economic growth, and to develop and commercialize new products depends upon an environment free of subsidies across both the Atlantic and the Pacific.

Thank you, Mr. Chairman.

SENATOR BINGAMAN. Thank you very much. Before we ask any questions, Mr. Clarkson, let me hear from Ms. Tyson.

Thank you very much for being here.

STATEMENT OF LAURA D'ANDREA TYSON, DEPARTMENT OF ECONOMICS, UNIVERSITY OF CALIFORNIA, BERKELEY: ACCOMPANIED BY PEI-HSIUNG CHIN

MS. TYSON. Thank you very much, Mr. Chairman. In introduction, I want to say that our remarks today are part of a larger study that Pei-Hsiung Chin and I have been doing on competition in the aircraft industry.

And although our written testimony does not deal with the Boeing Airbus dispute, I'd be happy to discuss that, as well.

I might also say that in passing that my co-author, Pei-Hsiung Chin, is a citizen of Taiwan but a resident of the United States. We started this project long before there was a potential deal between McDonnell-Douglas and Taiwan Aerospace and our statement today represents the interests that we perceive for the American industry.

With that as an introduction, let me just commend you very much for having this hearing. I found the initial session extremely stimulating. I believe it's the first time that I've heard sufficient attention directed to these issues. In fact, I think the overriding American attitude has been that since McDonnell-Douglas is a private company, this is a private deal and must be in the national interest.

Behind the American attitude is the presumption that if a private American company wants to undertake a deal, we should allow it. But McDonnell-Douglas is no traditional or ordinary private American company. It's the largest military contractor in the country, and it is the guardian of some of the nation's most sensitive technology.

And I don't believe that this is an ordinary market transaction either. The Taiwanese government is actively involved; the only question is the extent to which it is involved. Therefore, it seems totally appropriate that our government be on the other side of the negotiating table. But so far it is not.

Our testimony suggests a minimum strategy and a maximum strategy. At a minimum, our government should be negotiating up-front, right now, on three issues: the protection of military technology, subcontracting arrangements and subsidies.

On the military technology question, you might say, rest assured, CFIUS will take care of that. But, I think CFIUS itself must insist that we have continuing oversight of this deal to make sure that militarily sensitive technology is not transferred either now or, inadvertently, at some later date.

The second issue is subcontracting work. The Taiwanese government is putting up at least 30 percent of the money for subcontracting work.

In return it wants jobs. The Taiwanese government wants to build an aerospace industry; it wants more than 60 percent of the jobs created by this deal.

The U.S. should be negotiating on the other side. If this deal goes through, a more equitable arrangement about the location of subcontracting work might be made.

The Taiwanese government is negotiating for its position in the aerospace industry, and we should be negotiating for ours. We should do it now, not when it's too late.

Regarding subsidies, I absolutely agree with the position that Mr. Clarkson suggested. We must have an up-front agreement on the extent of subsidies, the kinds of subsidies, and some mechanism for oversight to make sure that those conditions are recognized.

Mr. Farren said:

> We hope the agreement... We hope the deal will adhere to GATT regulations. We hope the deal will adhere to any multi-lateral extension of GATT we might realize with the Europeans.

Hoping is not enough. The deal must be contingent on the condition that, at the very least, the Taiwanese government adhere to the GATT regulations. Since the Taiwanese are not signatories of GATT, this is otherwise not guaranteed.

I would go further. I would have them agree to adhere to any deal that we realize with the Europeans. If we don't do that up-front, we run the risk, I would say, of derailing any possibility for an agreement with the Europeans. And we have been negotiating, as you've heard today, since 1984—1983—for an agreement with the Europeans.

There is some reason to expect that, since GATT has come out against the Europeans in the first U.S. case, they will be pressured to come up with an agreement with the United States at this time. We are closer to a compromise than we have been at any time since 1984.

Now, the Taiwanese Aerospace-McDonnell-Douglas deal has entered the picture. If the terms for that deal are not similar to any we reach with the Europeans, the Europeans might be reluctant to sign a deal.

We certainly don't want to derail our efforts with Airbus on the hope that the Taiwanese will agree at some point in the future to a subsidy restriction.

We also agree with the comments Mr. Bryan made that it's highly unlikely that, given the numbers that you heard from Mr. Clarkson, this deal can go forward without big government subsidies.

The numbers show that McDonnell-Douglas's commercial operations are in a very serious financial situation.

MD is about to undertake the MD-12, the most expensive, technologically-advanced development program in the aircraft industry, to date.

This is a mismatch. The company has no money to do this. From this first infusion of $2 billion, $1.5 billion is going to retire its debt.

The figures don't add up. A lot of government money is implicit in this deal.

Why doesn't the private capital market in the United States enter this deal? The private capital market of Taiwan has entered, but private investors in Taiwan have the life-preserver and commitment of the Taiwanese government.

There will be additional funding out of that $76 billion worth of government reserves to help the deal along.

It's my interpretation that, if we set conditions on the subsidy issue up-front, the deal won't go through. It can't go through.

But let's assume that that's our minimum package. We negotiate on subcontracting, technology transfer and subsidies. And if the deal doesn't go through, it doesn't. If it does, we let it go.

We also lay out in the paper what I want to call a maximum position. The maximum position is that the U.S. should be opposed to this deal. It should be opposed to this deal because it's not in the national interest. It may be in McDonnell-Douglas's interest in the short term—indeed, it probably is in McDonnell-Douglas's interests in the short term; otherwise, they wouldn't be doing it. But the national interest is another question.

To argue why it's not in the national interest, you have to look at the aircraft market globally, and then you have to think about Boeing. That is, the American industry here is Boeing and McDonnell-Douglas and all of their sub-tier suppliers. But Boeing is the major American company in this industry. The market, for the foreseeable future, shows substantial excess capacity in the global marketplace, extending, by most estimates, through the decade.

Into this market, we're going to introduce a new, subsidized, I would argue, aircraft, the MD-12. The MD-12 is targeted against the Boeing 747. It's not targeted against a current Airbus model; it's targeted against a current Boeing model.

In this situation, the entry of a new product introduces a new round of trade friction between the United States and Europe. There is a round of very strong competitive pressure between Boeing, Airbus, and McDonnell-Douglas. Boeing's profits go down rather sharply. McDonnell-Douglas's profits, I would argue, are unlikely to go up much because, among other reasons, the MD-12 is not likely to be a very cost-effective product.

First, the MD-12 will involve a lot of people who have never been involved in aircraft production before. And there are substantial learning curves in aircraft production. Therefore, the MD-12 is likely to start out as an expensive aircraft.

Second, it's not likely to be around long. While it is an innovation—it's a bigger aircraft in terms of passenger size—it's not the next level of technology. The next level of technology is the Jumbo Jet long-distance technology, which the Europeans are threatening with the A-350. The MD-12 is a high-cost aircraft that will not last very long, will not provide profits to McDonnell-Douglas, and will hurt Boeing in the process.

What do the Europeans do in this situation?

If McDonnell-Douglas and Boeing are hurting one another, particularly with the help of subsidies from the Taiwanese, this makes it fairly attractive for the Europeans to subsidize the entry of the A-350. It's the next round of competition. It's the next serious innovation in the world.

But if the Europeans are smart, they will wait and see if the McDonnell-Douglas-Taiwan Aerospace deal goes through. They won't launch the A-350 right away—the market's suffering from excess capacity already. They will watch McDonnell-Douglas and Boeing inflict blows on one another—with the help of another foreign government—and waltz in at a later date with a subsidized entry of the A-350.

And I will argue that they will be better off.

Unfortunately, the history of the American aircraft industry is a sobering story. Lockheed and McDonnell-Douglas severely damaged one another with the MD DC-10, Lockheed 1011 competition. The resulting weakness in the market gave the Airbus governments the opportunity to develop the Airbus 300.

Success was not only due to Airbus's subsidies. Airbus came in with a model that was slightly different than the DC-10 and the L-1011, which, for all intents and purposes, are the same exact aircraft. They came into a situation where the American companies were knocking one another out.

What does this analogy suggest for U.S. policy?

You can't just oppose the MD-Taiwan aerospace deal. Something must be done to deal with the problem of McDonnell-Douglas.

I think this implies that the United States must come in with its own support policy. It must work with the leaders of American industry to come up with a public/private partnership to deal with the problems of the American aerospace industry, including the participation of private American capital as well as public American capital.

After all, the American aircraft industry, both commercially and militarily, is on the brink of a dramatic transformation because of military conversion.

Are we simply going to leave that to the marketplace?

Military conversion isn't a marketplace phenomenon in the first place. It's a government-created geopolitical phenomenon. Therefore, the government must deal with conversion. We can't simply leave it to the people of St. Louis to deal with. That would make no sense. So, the U.S. must come up with a strategic vision of how to rationalize, restructure, and refinance its entire aerospace industry.

Sadly, I don't believe that we're going to do that. Sadly, I'm not even convinced that the minimum package that we've proposed for setting conditions up-front will be effected.

In conclusion, let me say that it is our belief that the United States must take off its ideological blinders, recognize that many of our greatest industries, and certainly the one we are talking about here, have been beneficiaries of an unwitting backdoor industrial policy support program in the past. In its infancy, the aircraft industry was a product of the

Defense Department. Now, it's in a mature stage, but it still needs support, and it needs a vision.

Thank you very much.

[The prepared statement of Ms. Tyson and Mr. Chin follows:]

PREPARED STATEMENT OF LAURA D'ANDREA TYSON AND PEI-HSIUNG CHIN

Judged against almost any measure of performance--growth, exports, productivity, or innovation--the civilian aircraft industry has been a star performer for the American economy. More than any other, the industry is a symbol of the nation's technological and market dominance.

But today, McDonnell-Douglas, the nation's second largest producer, is in trouble. The company's commercial operations are teetering on the brink of bankruptcy, largely because its newest aircraft, the MD-11, has not been as successful as anticipated. To make matters worse, the end of the Cold War means substantial contractions in the company's military operations as well.

At the end of 1991, a white knight in the form of Taiwan Aerospace negotiated a deal with McDonnell-Douglas to revive its commercial business. Taiwan Aerospace, a public-private company established to build a Taiwanese aerospace industry, would buy a 40% equity share in Douglas Aircraft, the commercial arm of McDonnell-Douglas. Of this amount, at least 29% would be provided by the Taiwanese government. McDonnell-Douglas would use the money to retire its $2.7 billion debt and begin development of a new commercial aircraft, the MD-12. Taiwan Aerospace, as an equity shareholder of Douglas Aircraft, would be involved in the manufacturing and marketing of the MD-12, as well as the MD-80 and the MD-11, the company's other commercial models.

For McDonnell-Douglas, the proposed deal is a godsend. To remain a player in the commercial market the company needs a

*This testimony is based on a larger study included in the forthcoming book Who's Bashing Whom: Trade Conflict in High-Technology Industries to be published by the Institute for International Economics. The study was co-authored with Pei-Hsiung Chin, a PhD student in economics at the University of California, Berkeley.

substantial infusion of new capital. But private investors in the United States are unwilling to foot the bill. Despite its energetic efforts, the company has been unable to find American partners--either private or public--for its MD-12 project. The deal with Taiwan Aerospace not only provides substantial upfront capital but also holds the promise of additional money to cover the cost of launching the MD-12. In addition, the deal is a surefire way to improve McDonnell-Douglas' access to East Asia's dynamic markets for commercial aircraft. Finally, McDonnell-Douglas is also attracted by the lure of highly skilled but relatively inexpensive East Asian engineers and workers.

On the Taiwanese side, the motives for the deal are equally transparent. The Taiwanese government has accumulated the largest stash of foreign exchange reserves in the world--mainly as a result of its large trade surpluses with the United States. It wants to use these reserves to build a stronger Taiwanese economy. In pursuit of this long-range goal, it has targeted the aerospace industry not because of its commercial profitability but because of its special economic benefits in the form of technology development, export promotion, and high-wage job creation. Despite protestations to the contrary, there is a national security aspect to the Taiwanese decision. Taiwan cannot buy advanced military aircraft, because of pressure from China on the industrial countries, including the United States. An investment in the development of a commercial aircraft capability now may pay off in an improved military aircraft

capability sometime in the future.

While the Taiwanese government has been thinking carefully about the proposed deal, the American government has paid scant attention. Behind the American attitude is the presumption that what is good for a private company like McDonnell-Douglas is good for the nation. Although ideologically soothing, this presumption is irrelevant to the case at hand. McDonnell-Douglas is no ordinary private company--it is the nation's largest military contractor and the guardian of some of its most sensitive military technologies. And the proposed deal with Taiwan Aerospace is no ordinary market transaction--it involves the active participation of the Taiwanese government, without which the deal would collapse. Under these circumstances, what should the American government do to make sure American interests are served?

At a minimum, it should negotiate with the Taiwanese government on three issues: the protection of American military technology, subcontracting arrangements, and subsidies. On the first issue, the United States must guarantee that the deal is structured so that militarily sensitive technology does not fall into foreign hands. This will require regular monitoring of the deal by the Department of Defense or some other public oversight agency.

On the second issue, the American government should negotiate to ensure an equitable sharing of subcontracting work with the Taiwanese for the production of commercial aircraft by

McDonnell-Douglas. Understandably, the developmentally minded Taiwanese government wants to shift as many employment and production opportunities to Taiwan as possible to build a strong aerospace supplier industry. Shouldn't a strategically minded American government concerned with the long-run competitiveness of the American aerospace industry want to keep these opportunities at home?

Finally, the United States must negotiate with the Taiwanese on the amount and kinds of subsidies that will be allowed as part of their arrangement with McDonnell-Douglas. The company will need several billion dollars to develop the MD-12. Where will this money come from? In the unlikely event that private Asian investors supply the necessary funds, there is no public policy problem. But in the more likely event that the Taiwanese or other East Asian governments offer the bulk of development financing on non-market terms, the deal will violate and derail a proposed American agreement with the Europeans to restrict government subsidies for the aircraft industry.

Without such an agreement, the Europeans are likely to provide massive subsidies for a new Airbus model to compete with the Boeing 747. Boeing, in turn, will find itself confronted with heavily subsidized competition from both Asia and Europe. Under these circumstances, the dangers of a trade or subsidy war between the United States, Europe, and Asia will intensify, threatening to harm all sides and undermine the international trading system. For these reasons, the United States must not

allow the possibility of a substantive compromise with the Europeans to be jeopardized by the provision of Taiwanese subsidies to McDonnell-Douglas. This requires an upfront American understanding with the Taiwanese that their deal with McDonnell-Douglas adhere to current GATT regulations and to any future multilateral regulations on subsidies in the commercial aircraft industry.

The active participation of the American government on questions of technology transfer, subcontracting, and allowable subsidies may itself derail the deal between McDonnell-Douglas and Taiwan Aerospace. But perhaps this is as it should be. Indeed, the "cautious" minimalist approach for American policy prescribed so far begs the question of whether the American government should intervene to stop the deal altogether. A strategic analysis of the dynamics of competition in the commercial aircraft market over the next decade suggests strongly that it should.

The global market for commercial aircraft is currently in a slump that is likely to continue for several years. The entry of new capacity for the MD-12 will only make matters worse, having ominous implications for prices, profits, and trade conflict. Excess capacity will encourage cut-throat price discounting and aggressive sales techniques that are grist for the mill of trade disputes between the United States and Europe.

Ironically, the MD-12 is likely to pose the greatest competitive challenge to Boeing, not Airbus. If the MD-12 lives

up to its billing--which should not be taken for granted given recent performance shortfalls on the MD-11 and earlier problems with the DC-10--it will be approximately the same passenger size as the Boeing 747 but with a longer range. To meet the competition of the MD-12, Boeing will be forced to offer substantial price discounts on the 747, and its profits will decline.

At the same time, the MD-12 is likely to raise costs and reduce production efficiency in the American industry. Boeing's costs will rise as it is forced to contract production. In addition, the MD-12 is likely to be a high-cost aircraft for two reasons. First, many of the people involved in its production will have little or no experience producing commercial aircraft. Second, the MD-12 does not represent a major technological innovation over existing models, and is, therefore, not likely to have a long life cycle. Its replacement by a long-distance, jumbo jet of the sort envisioned in the Airbus 350 proposal seems likely by the end of the decade. However, without a long production run, costs on the MD-12 will remain high. Thus, while Boeing's profits are likely to fall as a result of the MD-12 competition, McDonnell-Douglas's profits are unlikely to increase. For the American industry as a whole, profits are likely to be reduced, not simply shifted from one producer to the other. At the end of the day, Boeing will probably be worse off and it is unlikely that McDonnell-Douglas will be better off. At best, it will remain a weak number three producer in the

industry; at worst, it will have prolonged its exit.

To make matters worse, it is possible that the Europeans will respond to the deal between McDonnell-Douglas and Taiwan Aerospace by deciding to launch the A350 now rather than waiting until demand conditions are more auspicious. If they do, excess capacity will only get worse, prices will soften still further, profits will nose dive, and trade friction between the United States and Europe will become even more pernicious. If, instead, the Europeans wait to launch the A350 until the market is right, the evolving competitive situation will bear an uncanny resemblance to the earlier round of competition between the DC-10, the Lockheed 1011, and the Airbus 300--the American companies will damage each other, reducing their capacity for the next round of product launch. At a more propitious moment, Airbus will then waltz into a more valuable market niche from a stronger relative position.

Given the predictable adverse consequences of the development of the MD-12 on the American industry, the U.S. government would be well advised to block its launch at this time. This implies opposing the deal between McDonnell-Douglas and Taiwan Aerospace in its current form. But active opposition is not enough.

The government must provide support for a forward-looking, domestically-based rationalization plan for MD's commercial and military operations, as well as a complementary plan for the conversion and rationalization of the nation's other military

aircraft operations. The American aircraft producers and their suppliers should participate in the formulation of these plans. They should be designed to reduce the adjustment costs and speed the inevitable process of conversion dictated by the post Cold-War environment. They should guarantee that the American industry will have the financial and technological capacity to meet the inevitable Airbus 350 challenge sometime during this decade. Ultimately, the most effective discipline on European actions in the aircraft industry is a credible commitment of American capabilities to match them in the marketplace.

Cooperation with Taiwan and other interested East Asian countries will help the United States in its competition with the European Airbus. The American industry stands to gain from closer links with the dynamic East Asian markets and from possible cost and production efficiencies of greater subcontracting relationships with East Asian suppliers. Taiwan and some of the other East Asian nations, in turn, are strongly interested in developing an indigenous aerospace capacity for the reasons noted earlier, and they have the financial willingness and wherewithal to do so. Compared to Europe, the United States has a strong advantage informing partnerships with these nations because of stronger trade and geopolitical links with them. Taiwan, like South Korea, is well aware of its dependence on the defense umbrella provided by the United States. As a result, the U.S. still exercises tremendous leverage in these countries, leverage that can be used to promote cooperative deals in the

aerospace industry that benefit all sides.

Sadly, it is almost impossible to imagine that the United States will adopt either the minimalist or the maximalist policy agenda proposed here. Few of the strategic questions about the possible adverse effects of the deal between McDonnell-Douglas and Taiwan Aerospace have even been raised in the public debate. This reflects a woeful lack of strategic vision in national policy circles about what is arguably the nation's most strategic industry. Ideologically, American policy makers remain committed to the fiction that market forces should determine competitive success, even though the most cursory reading of American economic history indicates that a defense-oriented industrial policy has been a major factor behind such success in the aircraft industry.

As the United States scales back its defense efforts, policy makers must discard their ideological blinders and refashion the nation's disguised and unconscious industrial policy into a commercially oriented economic strategy for the nation's high-technology industries. For obvious military and economic reasons, the aircraft industry is the place to begin the necessary ideological conversion.

SENATOR BINGAMAN. Thank you very much.

Mr. Chin, you were here to respond to questions if questions came up, as I understand.

Let me just advise everyone that I'll try to keep my questions to 6 minutes, and we'll try to do that all around and get through one round here and then get on to the remaining witnesses.

Mr. Clarkson, as I understood Mr. Farren's testimony, essentially, the position of the Administration is that some level of subsidy is not our preference in the case of Airbus, but that it may well be something that we have to settle for and agree to, and, if we do that, if there's a 20-25 percent developmental subsidy permitted in connection with Airbus on new aircraft, it would not be reasonable for us to try to impose different requirements on Taiwan.

That's what I understood his position to be. So, although we don't want a subsidy by the Taiwanese government, we might well have to accept one because of the precedent that we may well be pushed into in connection with Airbus.

I guess, given that as a starting point here, I just wonder where that leaves Boeing down the road.

Are we in a situation where 10 years from now, whoever replaces me in this job and whoever replaces you in that job are going to be sitting in this same room having a hearing on why Boeing is trying to sell a big chunk of its equity to some other foreign country?

Are you folks able to compete indefinitely with major companies which have a 20-25 percent developmental subsidy every time they decide they want to build a new aircraft or whatever level of subsidy?

MR. CLARKSON. Let me answer your question this way.

First of all, I guess I'm not very optimistic that the current negotiations with Airbus that are scheduled to conclude by the end of March will be successful.

I would hope that, in fact, an agreement would be negotiated between the U.S. Government and Taiwan that would set the standard of subsidization much closer to zero. Then, this would provide us with leverage with the Europeans to get a comparable deal on Airbus.

I think there's perhaps a little bit of a misunderstanding, though, about what the compromise was that's been proposed, relative to Airbus. It is not just 25 percent subsidy, unchecked. My understanding is that they could provide supports of up to 25 percent of the cost of the development. But that there would be a strong commitment that the support had to be paid back on commercial terms, and that there would be transparency so that you could ensure that cost, including the cost of money involved in paying that back, is reflected in the pricing of Airbus airplanes. Today, we have absolutely no transparency on the subsidies that Airbus gets. The company is set up under a unique French law, so nobody really sees the results. And the management of Airbus has no disciplines on it to show a profit.

So, the fact that we said that maybe 25 percent would be acceptable was only on the condition, one, that it had to be paid back close to commercial terms, and there would be complete visibility of that payback, and the discipline would be there that the airplanes would have to be reasonably priced to recover those monies.

SENATOR BINGAMAN. Let me ask either of you to respond to this other question and it relates to the subcontractors and subtiers. I think you said that you have about 3,000 subcontractors.

I would assume, and I know nothing about your industry, but I would assume that many of the folks who are your subcontractors also supply to the Defense industry?

MR. CLARKSON. That's correct.

SENATOR BINGAMAN. Those folks are going to be really hard-hit over the next few years as we shut down one production line after another in our Defense aircraft.

I would also assume that many of those subcontractors that you depend upon supply to McDonnell-Douglas.

MR. CLARKSON. In both cases, you are correct. We are very concerned about the restructuring of the aerospace industry that's going to be required because of the massive reductions.

SENATOR BINGAMAN. I guess the real question is: Are we looking at a situation where this deal goes through, we cut the Defense budget dramatically—inevitably, most or many of your suppliers are going to wind up being off-shore—that you're going to have to be looking overseas, as McDonnell-Douglas in fact looks to Taiwan, for more and more of its components.

It just looks to me as if we're not just talking about the three companies here—Boeing, McDonnell-Douglas and Airbus. We're really talking about these 3,000 companies that are supplying the large companies, and many of them are going to be in real dire straights to stay in business.

MR. CLARKSON. I agree with you. That's why I think it's important that we not just allow the aerospace industry in this country to be, if you will, restructured by default. I think that it has to be looked at.

For example, one of our largest suppliers—Northrop—makes the main body sections of the 747. Northrop is going to be a significantly different company with the demise of the B2 and some other programs it has.

You can go down many, many tiers. Obviously, one of the concerns about the decision that McDonnell-Douglas has taken to move approximately 70 percent of the MD-12 and perhaps its other programs to Taiwan, or perhaps even to the People's Republic of China, is that that will further exacerbate the situation in the United States.

SENATOR BINGAMAN. My time is expired.

Senator Bond, any questions?

SENATOR BOND. Mr. Clarkson, am I clear that Boeing would support this arrangement if there were no subsidies?

MR. CLARKSON. We said that we welcome foreign investment, but we want some assurances that subsidies will not be involved. Otherwise, we're not opposed to it.

SENATOR BOND. Ms. Tyson, do you support this deal if there's no subsidy?

MS. TYSON. Well, to me, that's a bit of an academic question. As an academic, it's an academic question, and, as I said in my stated testimony, I don't believe that's feasible.

SENATOR BOND. Ms. Tyson, I've looked at this arrangement, and I think we're talking about two different arrangements.

Where does the military technology come into it?

MS. TYSON. Are we talking about the military technology now, or the subsidies?

Which would you prefer?

SENATOR BOND. Let's start off with subsidies. You say that it cannot be unsubsidized.

MS. TYSON. I say it's highly unlikely, given all the facts that are in the public domain. Perhaps, you have some facts in the private domain that I don't have.

In the public domain, we have $2 billion—$1.5 billion debt retirement. We have estimates running from a minimum of $4 billion to a maximum of $10 billion for the cost of developing the MD-12.

We have a statement that the company will raise this money out of profits. But MD has had serious problems, not just in the last couple of years but since the DC-10, generating a significant amount of profit flow year-by-year.

Given the slump in the global industry, I don't see the MD-12 itself generating large revenues. So, yes, the numbers don't add up.

SENATOR BOND. I think that your analysis is faulty. You're not looking at the MD-80 and the MD-11. You said that there's going to be a 30 percent government investment.

MS. TYSON. I said Taiwan Aerospace is 29 percent owned.

SENATOR BOND. Do you know that Taiwan Aerospace is not the investment vehicle?

MS. TYSON. Let me ask Mr. Chin.

MR. CHIN. Let me supply information. Taiwan Aerospace is not set up for a project as big as the current project.

SENATOR BOND. It will be a manager.

I would just ask Ms. Tyson one last question.

Is it your view that it is in the national interest that McDonnell-Douglas get the dickens out of the commercial aircraft industry and let Boeing be the survivor?

This seems to be the essence. You want to say that we ought to get McDonnell-Douglas out of commercial aircraft so that Boeing can compete with Airbus without the challenge of McDonnell-Douglas.

MS. TYSON. I don't think anything I said would suggest that. What I suggested was that, because of all of the considerations of introducing the

MD-12 at this time, particularly with the help of what I believe to be significant Taiwanese subsidies, we should oppose the deal.

I then go on to say, in the next sentence, that the U.S. Government must do much more than that. It must come up with a support program for McDonnell-Douglas's commercial and military operations.

I did not say that McDonnell-Douglas should exit the industry, leaving it to Boeing, and I don't believe that should be the case, and I don't think that's in Boeing's interest.

But I do not think that the national interest is served by this deal. Therefore, we have to come up with an alternative arrangement.

SENATOR BOND. Mr. Clarkson, you pointed out the potential danger of the Republic of China trade practices. I think we would all agree that, when it comes to unfair trade practices and subsidies, Japan is really the Babe Ruth in this league.

They have developed trade subsidies, unfair competition, to a high art form. You talked about an undisciplined investment and, in your testimony, you stated that the U.S. Government should negotiate an agreement with Taiwan to include a provision for adequate transparency to ensure compliance with the agreement.

Are you ready to accept and negotiate with your Japanese partners a similar transparency arrangement as you have proposed for Taiwan, and impose on your Japanese partners in the 777 project or future aircraft the same kind of requirements?

MR. CLARKSON. I think that transparency exists today. Japan is a signatory to GATT and the GATT Civil Aircraft Agreement. We will make that available to you if you like it.

SENATOR BOND. Would you be willing to ask Mitsubishi to open its books to assure that Mitsubishi, as it participates, is not a beneficiary of direct, or some of the indirect subsidies that you indicated might be available through Taiwan to the proposed MD-12 arrangement?

MR. CLARKSON. Again, I think the books are open. But to the extent that you would think that they weren't, I certainly would be happy to ask.

SENATOR BOND. In 1989, when Boeing was considering an equity partnership with Japan, I believe Mr. Condit, the Vice President and General Manager of the 777 program, said that:

> We believe that government has established institutional safeguards that prevent the irresponsible transfer of technology.

Are those standards still in place? Would they not work as well now for McDonnell-Douglas as they have for Boeing?

MR. CLARKSON. I think the difficulty that exists in the proposed deal is that we're not talking about a subcontractor. It's the extent to which you can effectively tell a 40 or 49 percent owner that he can't have access to technology.

Obviously, in our relationships with the Japanese, where they're essentially a subcontractor, and we totally control what they see and what they don't see, we have what we consider core technology that we won't

show anybody. We even keep it away to the extent that we can from the Defense Department—not that they're leaky but, you know.

[Laughter.]

MR. CLARKSON. It's how we've maintained the position that we have. And I'm not saying that McDonnell-Douglas won't put the most thorough and careful controls in place relative to transfer of technology, but on the other hand, I think that the prime motivation and this is perhaps my personal opinion—not speaking for the Boeing company for a second—I think that the prime motivation of Taiwan Aerospace is to obtain technology.

Why else would you pay $2 billion for 40 percent of a portion of the company, the total market value of which, if you look at the current market value of McDonnell-Douglas on the stock market, the whole company has a value based on the stock market of $3 billion.

So, I think, again, prudence would suggest that we need to assure that technology transfer is well-protected, and I know, because I have spoken to my friends at McDonnell-Douglas, they intend to do that very soon. But I think it needs an independent look.

SENATOR BOND. Mr. Chairman, we will perhaps have written questions to submit later on because there are many things left to explore.

SENATOR BINGAMAN. Senator Sarbanes.

SENATOR SARBANES. Thank you very much, Mr. Chairman.

Ms. Tyson, let me say, first of all, I've heard a lot of testimony for many year in the course of serving in the Congress. And I must say that I thought you made a very powerful presentation. You've obviously done a lot of very careful study and analysis. And I'm drawn to some of your proposals.

And I want to explore those with you for just a few minutes.

Before I do that, though, I think I ought to give you and Mr. Chin a chance to put on the public record, right now, the response to Senator Bond's question that you didn't have an opportunity to develop, which, as I understood it, was directed to the point that the arrangement at the Taiwanese end of it, in effect, opened the door for a government subsidy to take place.

Was that the issue you were about to address?

MS. TYSON. Yes.

SENATOR SARBANES. Why don't you take a little bit of my time in order to elaborate on that.

MR. CHIN. Regarding Taiwan Aerospace: its original capitalization is not enough for the $2 billion that is required to engage in this equity investment.

So, the gap—which is more than half—is most likely to be filled by the Taiwanese government bank or by other government channels.

That's also the case for the Europeans because, in the aircraft industry, there is a tendency for concentration.

So, in order for MD to keep up with the leading firm, which is Boeing, government support is necessary. Otherwise, the European Airbus

would not be able to compete, and that's why we expect that unless there is government subsidy, the McDonnell-Douglas MD-12 will not be able to compete with Boeing in the marketplace.

Thank you.

SENATOR SARBANES. Ms. Tyson, do you agree with the comments that were in Mr. Clarkson's statement, which you just touched on, on the part of Taiwan, that this represents the Taiwanese government, that this represents a direct and concerted strategy to actually enter the aerospace industry; these various quotes here about the Ministry of Defense, the Ministry of Economic Affairs, these various plans that they've worked out in terms of where they're going with respect to their economy?

MS. TYSON. Yes, I do. I believe it's motivated primarily by economic concerns. But there are also national security concerns, which we mentioned in the written testimony.

Taiwan is a developmentally-minded government, and it has successfully promoted rapid economic development in the electronics industry, in the aerospace industry. I don't think it would dissemble.

I think, if you asked the Taiwanese government if they intended to promote their aerospace industry, they would say: Yes, we do.

They would also say that they do not intend to build a prime contractor capability. They're interested in the subcontracting subtier where they have relatively low-wage engineering talent compared to the United States. They want to move into this industry because of its growth potential, its export potential, and its research and development potential. I certainly believe that. And I think their efforts in other industries totally support that.

One thing on national security: it's not really discussed here, although it was alluded to in Mr. Clarkson's answer just now. Taiwan does, of course, have trouble getting advanced military aircraft because of its geopolitical position in the world.

To the extent that it can acquire technology in this way, which would enhance its own military aircraft capability, there's a real national-security element to their interest in this. Their interest is primarily economic, but one shouldn't overlook this other issue.

SENATOR SARBANES. I assume that if the Taiwanese get a large subcontracting component out of this arrangement that Boeing would come under increased pressure in Japan to give a larger percentage to Japanese subcontractors, even though there was no equity investment, the leverage being the large Japanese market for the purpose of Boeing planes.

But aren't they going to then look and say: Well, look, over in Taiwan, they're getting, you know, 50 or 60 or 70 percent of the subcontracting business, and we're only getting the various figures that you gave us earlier. And, you know, we want a bigger share.

You say, well, you're not an equity partner. They say, yes, but we are a big customer of yours and, look, we can't accept this gap, large gap, that exists between the sub-contracting share that Taiwan is getting out of McDonnell-Douglas compared to what we're getting out of Boeing.

Is that going to happen?

MS. TYSON. I should ask Mr. Clarkson to tell us about the pressure that they're under.

Let me just say that another smart government whose economy is growing—a number of East-Asian countries want to build an aerospace industry—may see the deal between McDonnell-Douglas and Taiwan and try to get a similar deal.

So, even if it doesn't happen in Japan, the possibility of it happening throughout Asia is very high. But I think that we should be worried about this deal on its own merits. The public information about the deal suggests that some of the subcontracting on all of McDonnell-Douglas's aircraft could move to Taiwan as part of this deal.

I believe this is the wrong time, particularly without any effort on our part, to accept the deal as written. After all, the Taiwanese government is favorably disposed to the American government. We might at least be able to negotiate the subcontracting number.

What Pei-Hsuing has said eloquently to me, is:

> Think of it this way. The United States has spent vast amount of monies in Taiwan's interest over the postwar period. The U.S. Government appears not to have the money to help McDonnell-Douglas right now. So, maybe the Taiwanese government will come in and help McDonnell-Douglas.

That suggests, of course, that we can negotiate with the good will of the Taiwanese government to get a better deal for the United States in terms of jobs. I think we should negotiate even if it doesn't have the spillover effect, which I think it will have.

MR. CLARKSON. Senator, yes, I agree that there will be some pressure from the Japanese to increase their involvement in programs. Their industry really hasn't grown significantly in 20 years. And it's been somewhat contained I think by government policy in Japan.

Obviously, if this deal goes forward, this policy may be reconsidered.

I might also add that because Taiwan is not a signatory to GATT or a full member of GATT, that they currently impose offset requirements on commercial sales to Taiwan.

So, when we sell an airplane, or when McDonnell-Douglas, for that matter, sells an airplane to China Airlines, or even the other big international airline there, or even one of the small domestic Taiwan airlines, they require you to put some work in that country.

Generally speaking, that is prohibited by GATT. So, we haven't had that same kind of problem in the commercial world that existed for a long time on the military side of the equation.

We are worried that as the total aerospace industry shrinks because of the defense cutbacks that we're going to see more and more pressure, either direct or indirect, in every commercial sale everywhere to put work in the country involved, particularly as many commercial airlines are either owned or controlled by their governments.

So, again, this is something I've talked to Mr. Farren about. He is a hawk. I felt a great deal of sympathy for him because he's been pushing harder than anybody else in the Administration to deal with Airbus. And I know he had to represent the Administration up here.

[Laughter.]

MR. CLARKSON. I just wanted to tell you that, if he carried the day in a couple of arguments, we'd have Airbus on the floor.

SENATOR SARBANES. We understood that. Had we not known that, it would have been a much, much rougher session.

[Laughter.]

SENATOR SARBANES. It may have seemed to him to have been a rough session, but it was nothing compared to what it would have been had the reputation, which you've just stated for him, not also been in the knowledge of the members of the Committee.

My time's up. The Chairman has allowed me to come ... Ms. Tyson, I am, of course, naturally attracted to your maximalist approach rather than to your minimalist approach, because it seems to me that this is what other countries are doing, and if we don't sort of wake up and get into this thing, they're going to take us to the cleaners. They're in the process of doing that.

As I understand it, you say that the government must provide support for a forward-looking, domestically-based rationalization plan for McDonnell-Douglas's commercial and military operations, as well as a complementary plan for the conversion and rationalization of the nation's other military aircraft operations.

American aircraft producers and their suppliers should participate in the formulation of these plans. They should be designed to reduce the adjustment costs and speed the inevitable process of conversion dictated by the post-Cold War environment.

Then, you go on about meeting the Europeans. So, you're not out to close down either of these two American companies. You're really out to create a partnership with them that rationalizes them and actually gives a lift to an industry in which we've been incredibly successful until we started facing this very unfair competition through these heavily-subsidized overseas operations.

Isn't that correct?

MS. TYSON. Absolutely.

SENATOR SARBANES. In fact, you go on to say that cooperation with Taiwan and other interested East Asian countries will help the United States in its competition with European Airbus.

Then, you go on to develop the possibilities. I think that it's a very strategic line of thinking that you're developing here because, obviously, we have a competition out of Airbus that is prepared to put out enormous subsidies.

Now, where's that going to take things?

We have to have a strategy to counter that. And your strategy, as I understand it, is essentially to find a way to sustain the two leading

American producers. And I take it that, in a developing arrangement with the Pacific Rim, that relationship then becomes an effective basis for the United Sates to compete with the Europeans and with Airbus.

Is that correct?

MS. TYSON. That's correct.

SENATOR SARBANES. Isn't there the danger that, if we fail to develop that, Airbus may develop such an arrangement to the further detriment of our two producers?

MS. TYSON. Yes. I do not see the Airbus danger going away for the reasons that we've heard this morning. We have been negotiating with Airbus for a very long period of time. The most we are likely to get is some reduction on the subsidy rate, not elimination of the subsidy rate.

The European Airbus has approached various East Asian supporters, governments and joint partnerships. They have identified that as a strategic capability or a potential strategic capability, which is one reason Boeing may be interested in protecting that possible strategic line of attack.

Let me talk about the vision that we're trying to suggest for the American industry. Airbus is a case in point. The Europeans tried for decades, with various national programs before Airbus, to develop commercial aircraft producers, and they all failed. They spent billions of dollars and they failed.

The key to Airbus's success was not just subsidies. It was rationalizing the whole European industry—creating a joint arrangement between several nations and their suppliers to come up with a set of products for the world market.

The Europeans needed a rationalization scheme. Without it, they would have failed.

Another example of lack of vision, which I mentioned before, is the missed opportunity for the United States. The United States missed in the DC-10 and L-1011 competition.

Even at the time, the DC-10/L-1011 competition was recognized as a battle which only one company could win and which would, in any case, cause serious, long-term harm.

McDonnell-Douglas was the winner, and it suffered serious, long-term consequences. Lockheed dropped out of commercial aircraft production. Only the life-preservers of their military operations—plus some loan guarantees and some U.S. Government policy allowing that type of competition—afforded those companies the ability to undertake that dreadful competition.

My concern about this proposed deal is that this is a way for the MD-12 to enter at a time when the market is not ready for this model, at a time when there will be, therefore, competition between McDonnell-Douglas and Boeing that will harm both. And the competition is going to be subsidized or allowed by the action of a foreign government.

And when I see it that way, I think that the United States, particularly given conversion considerations, should not miss another opportunity to

work with its own industry for a strategic, forward-looking solution. Both firms are going to get hurt here.

SENATOR SARBANES. Thank you, Mr. Chairman.

SENATOR BINGAMAN. Thank you very much.

Senator Bond, did you wish another question, since the Chairman did?

SENATOR BOND. A couple of quick things. We talked earlier about the policy of Taiwan to get into the aerospace industry. The Republic of China does want to enter it. It's clear, and I have the OTA book, *Competing Economies*, that the Japanese made a consistent effort beginning back in 1952, through MITI in the 1970s and 1980s, to target aerospace as an industry.

They're doing it. It's no secret. So, that's not news. But let me ask you, Mr. Clarkson, did the U.S. Government involve itself in negotiations when you negotiated with Mitsubishi over the kind of design work that would be carried on for your airplanes manufactured in Japan?

MR. CLARKSON. We kept the U.S. Government informed of what we were doing, and we knew what technology we were proposing to transfer or have them involved in.

SENATOR BOND. Just like the McDonnell-Douglas proposal is going forward now.

Number two, is it true that the Japanese firms have complete engineering responsibility for the work packages, so they have the assembly know-how and the design technology?

MR. CLARKSON. It's not true.

SENATOR BOND. They don't have the design technology.

Is Mitsubishi free to compete with you and the other Japanese companies by using the technology that you have transferred to them?

MR. CLARKSON. No, they are not.

SENATOR BOND. Do you have a contractual limitation?

MR. CLARKSON. Yes, sir.

SENATOR BOND. Let me just conclude, Mr. Chairman.

I thank you for giving me the extra moments. We may have some further questions that we'd like to follow up. But just let me say that I'm terribly depressed to hear it earnestly stated that somehow the government can rationalize the commercial sector and do for the United States's commercial aircraft industry what Airbus is doing for the European industry, because I thought everybody recognized that Airbus was evil.

We've seen what happened in Central Europe and what used to be the Soviet Union. And we ought to decide that having a very articulate consultant say that the market is not ready for the MD-12 is not something that the government should say, but it is for commercial interests to take that opportunity and make that risk.

And if it flies, it flies. If the private business interests who put up the money on both sides misjudged the market, then they are the losers. And there is no evidence that there will be any government subsidy to continue an operation that is not profitable.

Thank you, Mr. Chairman.

SENATOR SARBANES. Mr. Chairman, I just want to inject.

It's one thing if everyone was playing by the same rules and competing according to the market. I'm in favor of that. That's clearly my preference. That's the way it ought to work.

They ought to have to compete in the market, and they ought to have to compete on the basis of quality and cost.

That's not happening. These other countries are moving in and intruding themselves into the market in order to gain a competitive advantage for their firms and their workers and their jobs and their producers.

And it seems to me clearly inadequate to simply continue to reiterate this ideological position about commitment to the market, which, if it works, I don't question it. That's my preference.

But that's not what they're doing. And as a consequence of the holding of this rigid ideological position, we're being taken to the cleaners by these other countries.

Airbus has clearly done it. And now the danger is that Taiwan may do it.

It may or may not, but there's a danger here that has to be addressed. And I don't think it really helps to solve the practical problem that we're confronted with to keep going back to some sort of ideological fix.

Eventually, we may have one of these hearings, as the Chairman said, in 5 or 10 years and discover, yes, you know, we held to these rigid ideologies, and we don't really have an aerospace industry any more. And we're no longer running a $30 billion balance-of-payment surplus in this particular segment, the most successful sector in the international competitive economic environment that we have in this country.

Now, I am for the market, but it's ridiculous to hold to some sort of rigid ideology, and to have these other countries come in and take us to the cleaners on this thing. We have to have a competitive strategy on our part to address this situation.

MS. TYSON. Can I just say one thing for the record?

SENATOR BINGAMAN. Why don't you make a short statement. Then, we need to get on to our other three witnesses.

MS. TYSON. It's in the nature of a clarification.

Since I am here, next to a Boeing representative, and Mr. Bond used the word "consultant," I want to mention that this comes from an academic study of the commercial aircraft industry, I have no connection to either McDonnell-Douglas or Boeing. And just for the record, there are certain parts of the study that Boeing doesn't like either.

[Laughter.]

SENATOR BOND. My apologies. I should have said "academic." I was looking for a term. And I would agree with the Chairman that we should not kill the industry, particularly by government intervention, in the United States.

SENATOR BINGAMAN. This seems like it might be a debate that will continue for awhile. So, let me thank these witnesses very much. I think you've made very good statements.

Let me ask Mr. Wolf, Executive Vice President with Douglas Aircraft Company if he would come forward and make his statement.

Mr. Wolf, I see that you're accompanied by Mr. Olmer. We're pleased to see Mr. Olmer here.

Why don't you go right ahead? If you would summarize your statement? As you are undoubtedly aware, we have taken too long in this hearing with other witnesses. We would like to hear your main points, and then we'll probably have some questions.

STATEMENT OF JOHN D. WOLF, EXECUTIVE VICE PRESIDENT FOR COMMERCIAL, DOUGLAS AIRCRAFT COMPANY: ACCOMPANIED BY LIONEL OLMER

MR. WOLF. Thank you, Mr. Chairman. I have submitted written testimony, but will summarize it here.

I thank you for letting McDonnell-Douglas appear once again before your Subcommittee to address the actions we've undertaken to strengthen our company's ability to compete in the global civil market.

Our proposed alliance with the investors in Taiwan will build state-of-the-art commercial aircraft in a cost-efficient way, enabling us to compete effectively worldwide.

The alliance will combine three elements which are critical to our future success in the commercial aircraft business: capital, low-cost production and access to the Asian market—the fastest-growing region in air traffic.

Since our president, Bob Hood, appeared before your Subcommittee in December, we have embarked on a comprehensive evaluation process. A Taiwan evaluation team is currently preparing a report that, if deemed sufficiently positive, would allow the next steps toward a detailed agreement to be taken.

If an agreement is concluded, it will be subject to the requisite approval of the U.S. Government. As is the case with any proposed partnership of this magnitude, the debate has included some confusion of the facts and unfounded allegations.

For example, there has been some speculation that our proposed alliance with investors from Taiwan will not be made strictly on commercial terms and that the new company might become an Asian Airbus.

Others have claimed that the proposed alliance could deal a devastating blow to the U.S. supplier base.

I'd like to take the opportunity to correct some of this information that the debate has generated.

Boeing has expressed concerns that our potential alliance could create, quote, "another subsidized competitor shielded from market reality." End quote.

Let no one be mistaken that the intended structure of our alliance, unlike Airbus, will be a commercial venture.

McDonnell-Douglas, its shareholders and our future investors expect and will demand that the new company generate revenues that exceed costs.

There will not be additional money required by investors. If financing of ongoing operations is required, we will access commercial capital markets.

We're not seeking subsidies. There are no subsidies involved in our strategy. We have and we will continue to operate on a commercial-free enterprise basis.

I was surprised to learn this morning from Boeing's testimony that they were, in fact, subsidized by Japan, albeit small.

In a shrinking global market with fewer producers, higher degrees of efficiency are mandatory. David Mallory of the University of California at Berkeley testified before this Committee in december that:

> Penetration of foreign markets has become increasingly more critical for U.S. manufacturers of commercial aircraft.
>
> Higher development costs and the need to share risk between U.S. producers would increase the need to abet the company on each point.

A new technical program today costs $4-5 billion; notwithstanding the other views expressed earlier this morning at this hearing, the MD-12 does fall into this category.

The $10 billion figure stated before this Committee is, frankly, preposterous. A substantial portion of this cost is for facilities which we intend to lease. The remaining is financeable on the basis of our ongoing current production programs.

The equity partnership envisioned by our alliance would enable the new commercial aircraft company to compete efficiently and fairly, while establishing a strong customer base in Asia.

The Asian market is the fastest-growing market for air travel. Industry analysts have forecast that, within 18 years, airline travel in the Asian market will equal that of the U.S. domestic market.

As industry analysts have observed, gaining access to the Asian market is dependent upon having established business contacts, including local manufacturers. Boeing decided this some years ago when it made the establishment of its current relationship with the Japanese aerospace industry.

In fact, in February 1992, the International Herald Tribune reported that Boeing is prepared to broaden its cooperation with Japanese manufacturers to build a Super Jumbo Jet.

Speaking at this most recent air show, a Boeing executive vice president said: "If we can satisfy our customers' needs with a program that is truly an international venture, then we will do it."

That sounds to me like there is not only pressure for more in Japan, but Boeing is happy to comply with it.

Incidentally, at the same time, Airbus was simultaneously announcing their intention to do business with those same Japanese manufacturers for the A-350.

You asked that we address the question of how many prime contractors can profitably exist in key segments of the commercial aircraft market.

The fleet has continued to expand, providing the necessary capacity to transport the growing number of commercial passengers. Over the next 20 years, the worldwide market for commercial jet aircraft will require over 14,000 additional units with a value of approximately $1 trillion in constant 1990 dollars.

More than 4,700 of these deliveries are to replace retired aircraft. The remaining 9,300 aircraft account for growth in the marketplace.

The number of firms that can earn profits depends on how much the cost structure of the firms is in the industry. It also depends upon the demand for the industry products.

The number also depends on the differences among the products offered. A perceived quality advantage is highly desirable in the marketplace.

Our proposed alliance with Taiwan's aerospace industry will allow the new company to build highly efficient, new production facilities in the United States and Taiwan, thus lowering costs and enhancing quality.

The demand for commercial aircraft is strong and the market certainly can support three commercially motivated manufacturers.

Since its introduction in 1969, the Boeing 747 has enjoyed 100 percent of the high-capacity long-range market. The 747 is a mature and very profitable program. Surely, after 23 years, it could withstand some competition.

The MD-12 will benefit the world's airlines by enhancing profitability while keeping fares low for the traveling public.

I'd like to address the issue of technology. There are three categories of technology that are relevant to our discussions here.

First, there is technology for military aircraft applications. Second is the integration of technology to enable development and manufacturing of new commercial aircraft. And, third, the application of that technology which enables aircraft manufacturers to remain on the leading edge and is supplied through normal supplier channels.

On military applications, let me say once again for the record that McDonnell-Douglas will not make available to this commercial enterprise any existing or future military technology. There will be no transfer of military technology.

On the January 1, 1992, Douglas Aircraft Company formally separated the accounting and management of our government and commercial businesses.

With these and other existing safeguards, acquisition of military technology and our commercial business would be impossible.

A second category of technology integrates various disciplines, such as manufacturing, design, engineering and cost analysis, to enable the development, certification and production of a new generation of aircraft.

Working closely with Taiwan, technical personnel together will develop processes and systems that will result in the high-quality, cost-effective new generation aircraft.

The third category of technology is the application through suppliers. Our suppliers will continue to advance state of the art technology, and we intend to utilize it aggressively in the aircraft to be assembled here in the United States. I might add our competitors will do the same.

Regarding the impact of our new company on U.S. suppliers, generally, 60-70 percent of the cost of the airplane is purchased from suppliers either in the United States or overseas. Today, 20 percent of the MD-11 and 16 percent of the MD-80 are produced by foreign entities. Large structural assemblies of the MD-12, which include the fuselage and the wing structures, will be manufactured in Taiwan.

Without the MD-12, there will not be additional commercial aircraft manufacturing jobs in the United States. The majority of the U.S. suppliers will continue to have the opportunity to compete for about 75 percent of the MD-12 business.

The wings and fuselage constitute 25 percent of the MD-12 airplane, not 70 percent that was noted earlier.

As is done today, large and small companies will subcontract a portion of their jobs to other U.S. companies. The net result will be, just as today, jobs in the United States, even though a portion of the aircraft will contain foreign content.

U.S. suppliers, with some limited exceptions, understand this concept and view it in a positive manner.

Not building the MD-12 means helping Airbus to develop an MD-12 counterpart with the preponderance of jobs in Europe, not in the United States.

Final assembly of the MD-12 will be at a new facility at a yet-to-be-determined site in the United States, creating approximately 5,000 new American jobs.

Let me reiterate the new company will be a commercial venture which will be expected to generate revenues that exceed costs. It will compete in the world market through innovative technology, low-cost production and strong marketing. If cash is needed, it will be obtained by the new company accessing commercial markets.

Mr. Chairman, please be assured that our proposed alliance does not alter our support of the U.S. Government's actions already taken and being contemplated with regard to the massive European subsidies to Airbus. There never would have been a conflict with the Europeans over Airbus if their products were sold in the marketplace in a fair and rational manner.

Our proposed alliance with the aerospace industry and investors from Taiwan will position McDonnell-Douglas solidly for the future. It will ensure the growth of aerospace in the U.S. while fostering strategic international alliances. It is a concept based on sound business principles and is deserving of your support.

Thank you for the opportunity to appear before you today. I'll be happy to answer any questions.

[The prepared statement of Mr. Wolf follows:]

PREPARED STATEMENT OF JOHN WOLF

Mr. Chairman, I am John Wolf, Executive Vice President for Commercial at the Douglas Aircraft Company located in Long Beach, California. I thank you for letting McDonnell Douglas appear once again before your subcommittee to address actions we have undertaken to strengthen our company's ability to compete in the global civil aircraft market.

Our proposed alliance with investors in Taiwan will build state-of-the-art commercial aircraft in a cost-efficient way, enabling us to compete effectively worldwide. The alliance will combine three elements which are critical to our future success in the commercial aircraft business: capital, low-cost production, and access to the Asian market, the fastest growing region in air traffic.

Since our President, Bob Hood, appeared before your subcommittee on December 3, 1991, we have embarked on a comprehensive evaluation process. A Taiwan evaluation team is currently preparing a report on the commercial aircraft market, the projected operations, and financial aspects of the new company. This evaluation report, if deemed sufficiently positive, would allow the next steps toward a detailed agreement to be taken. If an agreement is concluded, it will be subject to the requisite approval of the US Government. The background and rationale for our decision to seek a strategic alliance with, among others,

Taiwan's aerospace industry is well documented in our testimony submitted for the record of your previous hearing on this subject. A few points are worthy of additional comment.

As is the case with any proposed partnership of this magnitude, the debate has included some confusion of the facts and unfounded allegations. For example, there has been some speculation that our proposed alliance with investors from Taiwan will not be made strictly on commercial terms and the new company might become an "Asian Airbus", succeeding in private industry through the use of public subsidies. Others have claimed that the proposed alliance could deal a devastating blow to the US supplier base. I would like to take this opportunity to correct the misinformation the debate has generated.

SUBSIDIES

Boeing has expressed concerns that our potential alliance could create "another subsidized competitor shielded from market reality." Their statements attempt to distinguish themselves from our alliance, claiming that their risk-sharing partnership with Japanese industry on the new 777 aircraft is inherently different.

A recent report authored by the Office of Technology Assessment (OTA) notes that the Japanese Government has actively assisted its aerospace industry, which in turn has joined a risk-sharing

partnership with Boeing. According to OTA, "Japanese companies' 20% participation in the 777, launched in late 1990, will probably cost $1.2 to $1.3 billion. Of this, $700 million is development expense, half of which is eligible for MITI support."

Furthermore, once the Japanese firms have fulfilled their obligation on the 777 arrangement, they are free to pursue the global aerospace market in any way they choose. For example, an article in the Wall Street Journal last November reported that Airbus had approached Boeing's Japanese partners to begin discussions on the development of a 600-passenger aircraft. Under their current risk-sharing arrangement, Boeing's Japanese partners could in fact collaborate with Airbus on development of a next-generation aircraft down the road. This is in stark contrast to our proposed alliance where the company would have an operation in Taiwan. Boeing is creating potential competition in Japan; we are not creating a competitor in Taiwan, but a long-term partner.

Let no one be mistaken about the intended structure of our alliance. Unlike Airbus, the new company will be a commercial venture. It will be expected and required to maintain existing commercial aircraft programs and to launch new programs in pursuit of financial returns for the investors. McDonnell Douglas, its shareholders, and our future investors expect and will demand the new company to generate revenues that exceed

costs, and to compete successfully in the international marketplace through innovative technology, low-cost production, and strong marketing. If needed, the new company will access financing through commercial capital markets. Owners will not be required to make additional investments.

The contemplated venture will not undercut US trade policy or the strong GATT cases against Airbus. Indeed, the massive European subsidization of Airbus still poses a major threat to legitimate international competition, to the US trade balance, and to US rights under the GATT. The US Government should continue to aggressively pursue this matter.

EQUITY V. RISK

The aerospace industry has been for years, and will continue to become, even more international in scope. International agreements comprised of joint ventures, licensing agreements, codevelopment, and production have become the norm. In a shrinking global market with fewer producers, higher degrees of efficiencies are mandatory. David Mowery of the University of California, Berkeley, testified before this committee on December 3, 1991, that "penetration of foreign markets has become increasingly more critical for US manufacturers of commercial aircraft. Higher development costs and the need to share risk require US producers to create alliances which reduce the need to 'bet the company' on each new program." A typical new program

today costs $4 to $5 billion.

The equity partnership envisioned by our alliance will enable the new commercial aircraft company to compete efficiently and fairly, while establishing a strong customer base in Asia. The Asian market is the fastest growing market for air travel. Industry analysts' forecasts have shown that within 18 years, airline traffic in the Asian market will equal that of the US domestic market. As industry analysts have observed, gaining access to the Asian market is dependent on having established business contacts, including local manufacturers. Boeing decided this some years ago when it pursued the establishment of its current relationship with the Japanese aerospace industry.

Aircraft manufacturers have long recognized the advantages of forging international alliances. Engine companies have invested in each other's aircraft engine divisions and now operate as a single company for certain joint ventures. General Electric and the French company, Snecma, have a 50-50 partnership in CFM International. United Technologies and Daimler-Benz of Germany invest in each other's aircraft divisions and operate as a single company for certain joint ventures.

In his December 3, 1989, written testimony before the House Committee on Science, Space, and Technology, Philip M. Condit, Executive Vice President of The Boeing Company, described

Boeing's plans for an equity partnership in 1986 with Japan:

> An MOU (Memorandum of Understanding) was signed in March, 1986 by Boeing and Japan Aircraft Development Corporation (JADC, a quasi-government owned consortium) and MHI [Mitsubishi Heavy Industries], KHI [Kawasaki Heavy Industries], and FHI [Fuji Heavy Industries] to jointly develop, produce and market an all new short-to-medium range, medium-size commercial transport, designated the 7J7. The Japanese companies would collectively have a 25% equity role, would share in all investments, risks, sales financing and revenues in proportion to their equity position and would share in jointly developed technology in an agreed upon manner.

Although a formal agreement was never actually consummated, Boeing nevertheless pursued an equity arrangement. The Chairman and Chief Executive Officer of The Boeing Company stated in a speech to the Council on Foreign Relations in New York this past January that Boeing probably would consider an equity arrangement again, although they do not now have any relationship.

The February 25, 1992, International Herald Tribune reported that Boeing is prepared to broaden its cooperation with Japanese manufacturers to build a super-jumbo jet. Speaking at the Singapore Air Show, a Boeing Executive Vice President said: "If we can satisfy our customers' needs with a program that is truly an international venture, then we will do it."

THE IMPACT ON COMPETITION

The subcommittee's invitation asked us to comment on the impact the MD-12 would have on the competition. Since its introduction in 1969, the Boeing 747 has enjoyed 100% of the high-capacity

long-range market. The 747 is a mature and profitable program. Surely, after 23 years it could withstand some competition. Because of its range advantage over the 747-400, the MD-12 will open up long-range markets previously unserved by any commercial aircraft, while carrying a higher payload with lower operating costs. The MD-12 will benefit the world's airlines by enhancing profitability while keeping fares low for the traveling public. In addition, by strengthening our wide-body family, the MD-12 will help the MD-11 compete against the Airbus A-340.

I understand the subcommittee is concerned about the impact the new company and the MD-12 will have on US manufacturing. In part, this is our effort to generate competition for an aircraft which has had no real competition. Our alliance is certainly in the spirit of our free market system. We feel we should be able to compete and at a minimum, reduce the impact of Airbus on the market - allowing more of the manufacturing done for the market to be in the US. You also asked that we address the question of how many prime manufacturers can profitably exist in key segments of the commercial aircraft market. As you are aware, there are three major manufacturers producing large commercial aircraft for the world's jet fleet. The fleet has continued to expand, providing the necessary capacity to transport the growing number of commercial passengers. Over the next twenty years, the worldwide market for commercial jet aircraft will require over 14,000 additional units with a value of approximately $1 trillion

(constant 1990 dollars). More than 4,700 of these deliveries are to replace retired aircraft. The remaining 9,300 aircraft account for growth in the marketplace.

The number of firms that can earn profits depends as much on the cost structure of the firms in the industry as it does on the strength of demand for the industry's products. The number also depends on the differences among the products offered; a perceived quality advantage is highly desirable in the marketplace. Our proposed alliance with Taiwan's aerospace industry will allow the new company to build highly efficient new production facilities in the US and Taiwan, thus lowering costs and enhancing quality. The demand for commercial aircraft is strong. The market can certainly support three commercially motivated manufacturers.

TECHNOLOGY

I would now like to address the issue of technology. There are three categories of technologies that are relevant to our discussions here. First, there is technology for military aircraft applications. Second is the integration of technology to enable development and manufacturing of a new commercial aircraft. And third, the application of that technology that enables an aircraft manufacturer to remain on the leading edge.

There has been a lot of concern about the first category of technology: military applications. Let me say, once again for

the record, that McDonnell Douglas will not make available to this commercial enterprise any existing or future military technology. There will be no transfer of military technology--such as refueling design or military electronics--from the military businesses within the McDonnell Douglas Corporation to this new commercial company.

On the first of January 1992, Douglas Aircraft Company formally separated the accounting and management of our government and commercial businesses. With these and other safeguards, acquisition of military technology in our commercial business will be impossible.

The second category of technology integrates various disciplines such as manufacturing, design engineering, and cost analysis to enable development, certification, and production of a new-generation aircraft. In order to achieve this, we intend to create what we call "centers of excellence." Centers of excellence bring people from different disciplines together to develop and apply technology cost effectively and efficiently. After careful technology transfer review, we will work closely with Taiwan technical personnel to enable effective and cost efficient design, development, and production of the MD-12 aircraft parts to be manufactured in Taiwan. Working together, we'll develop processes and systems that will result in a high-quality, cost-effective, new-generation aircraft.

The third category of technology is the application of technology through suppliers. There will be advances in technology that will benefit aerospace in general, such as better structural materials and methods for analyzing aerodynamics with ultra-fast computers. Our suppliers will also continue to advance the state-of-the-art by utilizing ultra high-temperature turbine technology on engines or applying the latest high-density packaging approaches to microelectronics. We intend to utilize this category of technology aggressively in the aircraft which will be assembled here in the US. And, I might add, our competitors have and will do the same.

SUPPLIER BASE

You also asked us to comment on the impact of the new company on US suppliers. Generally, 60 - 70% of the cost of the components of an airplane are purchased from suppliers in the US and overseas. Today, 20% of the MD-11 and 16% of the MD-80 are produced by foreign entities. I believe Boeing's 767 has at least 30% of its subcontract work done in Japan and Italy.

Large structural assemblies of the MD-12, which include the fuselage and wing structures, will be manufactured in the new US company's facility in Taiwan. This work is approximately 40% of the cost of the airframe, or about 25% of the total airplane. Today, the equivalent work is performed by McDonnell Douglas Canada and by the Convair Division of General Dynamics which has

indicated that the commercial transport business is no longer core to their primary business. Without the MD-12, there will not be additional commercial aircraft manufacturing jobs of any kind in the US.

The majority of the US suppliers who currently provide parts such as raw materials, equipment, landing gear, engines, castings, etc., will continue to have the opportunity to compete for our business. As is done today, large and small companies will subcontract a portion of their jobs to other US companies. The net result will be, just as today, jobs in the US, even though a portion of the aircraft will contain foreign content. US suppliers, with some limited exceptions, understand this concept and view it in a positive manner. Not building the MD-12 means helping Airbus to develop an MD-12 counterpart with the preponderance of jobs in Europe, not in the US.

Final assembly of the MD-12 will be at a new facility, at a yet-to-be determined site in the US, creating approximately 5,000 new American jobs. Upon final agreement, we will select a US site and start construction of this major final assembly facility. This alliance will save existing jobs and create new jobs.

SUMMARY

McDonnell Douglas Corporation has turned the corner. Last year we had our strongest earnings in our history ($423 million), but we have a long way to go. The commercial aircraft business had operating earnings of $300 million. These earnings compare with an operating loss in 1990 for commercial aircraft of about $90 million. Revenues for the corporation increased from $15.9 billion to $18.4 billion in 1991.

McDonnell Douglas' aerospace debt decreased to approximately $2.4 billion at the end of December, 1991. This compares to debt of $3 billion at the end of 1990 and a peak of $3.3 billion at the end of March 1991. This reduction is a result of lower operating expenses and stringent cash management.

McDonnell Douglas is a growing and strong company. Our alliance with Taiwan's aerospace industry and investors is one of mutual benefit, a win-win situation. The new company created by this anticipated 40% equity investment would be debt-free with substantial borrowing power in the world's commercial markets. The new company would have assets of over $5 billion. It would have two solid production commercial airliner programs, the MD-80/90 twinjets and the MD-11 trijet, which will generate cash and earnings to fund most of the development bill on the MD-12.

Let me reiterate, the new company will be a commercial venture which will be expected to generate revenues that exceed costs, and will compete in the world market through innovative technology, low-cost production, and strong marketing. If cash is needed, it will be obtained by the new company by accessing commercial markets.

Mr. Chairman, please be assured that our proposed alliance does not alter our support of the US Government's actions already taken and being contemplated with regard to massive European subsidies to Airbus. There never would have been a conflict with the Europeans over Airbus if their products were sold in the marketplace in a fair and rational manner. As long as their pricing bears no relation to true costs and transparency continues to be elusive, the US Government must continue to engage them on these issues.

The world is getting smaller. Just as the US was faced with the prospects of a profoundly different world at the end of the Second World War, our Nation is once again faced with a similar situation. The Cold War is over and our Nation stands on the threshold of a fundamentally new era. Economic and trade alliances are forming at a rapid rate, blurring traditional national boundaries. As much change as we have witnessed over just the past several years, business relationships are at the forefront in defining what the new world order will be. McDonnell Douglas is not just watching the profound trends in globalization, we are embracing them. Our company's and our Nation's strength and future is dependent upon the ability to prudently assess worldwide opportunities and make the right decisions and take the appropriate actions to ensure that we are part of the leading economic force.

Our proposed alliance with the aerospace industry and investors from Taiwan will position McDonnell Douglas solidly for the future. It will insure the growth of aerospace in the US while fostering strategic international alliances. It is a concept based on sound business principles and is deserving of your support.

Thank you for the opportunity to appear before you today. I would be happy to answer any questions.

SENATOR BINGAMAN. Thank you very much.

Let me just ask one line of questions.

My understanding is that McDonnell-Douglas's initial discussions, or discussions to date with Taiwan Aerospace, were a result of a conclusion that you were not able to raise the cash you needed to go forward with the MD-12 in normal commercial markets, that you were not able to borrow that money or could not find an American partner that would pursue that with you.

Am I incorrect in that?

MR. WOLF. The situation in the discussions that occurred with Taiwan on the MD-12 are a product of our strategy that indicated that we needed three elements.

We needed to have capital. We needed low-cost production. And we needed access to the Asian market, which was the fastest-growing region. It is the product of that strategy that has resulted in these discussions.

SENATOR BINGAMAN. I guess the point, to just get to it, is that, if you have not been able to find the capital needed in the normal commercial markets to go forward at this stage, what leads you to conclude that you'll be able to find the additional capital? And it will take substantial additional capital to develop MD-12.

How can you find that in the normal commercial markets down the road? What will change that will make this an attractive investment or a loan opportunity down the road?

MR. WOLF. We indicated that the major use of the capital that would be infused through this equity investment would be used to reduce McDonnell-Douglas's debt. That means the parent corporation would be strengthened financially and that this new commercial venture would be able to start with zero debt.

At the same time, the commercial venture would have a strong balance sheet with zero debt, and with a strong balance sheet, we're confident that we can access commercial markets, as any other commercial enterprise would, to finance our ongoing operations.

At the same time, we expect significant income to continue from our current production programs, and those sources would be sufficient to finance our MD-12.

SENATOR BINGAMAN. Let me defer to Senator Bond for his questions.

SENATOR BOND. Thank you, Mr. Chairman. I have been asked by Congressman Armey to ask the following question: If McDonnell-Douglas doesn't make the MD-12, do we have any assurance that another producer in the United States will be in the picture? Or, are we likely to have no U.S. parts, labor and engineering skills? Have, perhaps, Ilyushin and Tupelev in the current PRC assembly operations of the Douglas MD-80 aircraft making up a consortium, or, is an all-Japanese consortium a possibility after they obtain sufficient experience?

MR. WOLF. Senator, what is most likely, if there is not an MD-12, is that McDonnell-Douglas itself will be going out of business, unable to compete.

SENATOR BOND. In the commercial business?

MR. WOLF. The commercial business, that's correct. We could lose all of those jobs. It's less likely that another consortium would emerge from suppliers, as it would be that Airbus would enter that portion of the market and take over that business in those jobs.

SENATOR BOND. I appreciate your clearing away some of the chaff, but it is very clear, I gather, from McDonnell-Douglas's standpoint that if, as was suggested on the prior panel, we make the MD-12 go away because it isn't the right time for it, sending the MD-12 away will also take all of the jobs that are now in the United States on the MD-80 and the MD-11.

Is that correct?

MR. WOLF. That is correct, Senator.

SENATOR BOND. It would require a massive government rationalization to recreate it under those circumstances.

There's been some discussion and I think we ought to clear it up that, if—and I certainly hope it doesn't—but if our agreements with the European Community over Airbus lead to a necessary multilateral arrangement in which some government subsidies are permitted, number one, would not that same multilateralism permit Japan to subsidize, in part, its commercial aircraft partners; and, number two, in any case, would McDonnell-Douglas accept subsidies from the Republic of China on the MD-12?

The first question is, does it open it for Boeing?

MR. WOLF. The answer is, of course, it would.

On the other hand, we should state that our position has steadfastly been that there should be no subsidies, to us or to anyone else in this business.

SENATOR BOND. Can you tell me where the work on the wing and fuselage of the MD-12—I mean, the MD-11 and the MD-80—is currently being done?

MR. WOLF. All of our wings today are produced in Canada. Fuselages for the MD-80s are produced in Salt Lake City. Fuselages for the MD-11 are produced by Convair, Division of General Dynamics, in San Diego.

SENATOR BOND. Is that up for sale?

MR. WOLF. Convair and General Dynamics have indicated that they no longer intend to keep that portion of their business as core to their future and have been interested in offers.

SENATOR BOND. From abroad?

MR. WOLF. From anywhere.

SENATOR BOND. Incidentally, where will the wing and fuselage of the Boeing 777 come from?

MR. WOLF. My understanding is that the wing itself is produced in the United States, but the fuselage has substantial foreign participation also from Italy.

SENATOR BOND. How many segments of the commercial aircraft industry does Douglas currently compete in?

MR. WOLF. We compete in two of the five segments of the business, in the 150-passenger segment and the 300-passenger segment with the MD-11.

SENATOR BOND. And you can continue to compete just in two?

MR. WOLF. The difficulty is that our airline customers need a family of products, particularly in the wide-body segment. And, without an MD-12, the MD-11 is no longer going to be viable on its own with those airline customers. So, the idea that we would be able to continue at our current production rates, and be able to continue the jobs that are here in the United States and with our suppliers with an MD-11, without an MD-12, that is a fallacy.

SENATOR BOND. Several people have suggested on earlier panels that, if the MD-12 were to go away and Douglas were to shut down, as would be the logical occurrence, that all that business would go to Boeing.

Is that your assessment?

MR. WOLF. I think all of that business would go to the remaining competitors, which would certainly be Boeing and Airbus.

SENATOR BOND. I would gather that McDonnell-Douglas and the potential Taiwanese business partners would disagree with the new article made in the paper today, which says: "There is an over-capacity in this market."

Do you think there's a reasonable business opportunity to sell all these MD-12s?

MR. WOLF. As we stated earlier, our business projections, which, by the way, are quite consistent with Boeing's projections and other projections of engine manufacturers and others in this business, indicate that there is significant growth in this business in the next 20 years, with that growth centered right on top of the marketplace that the MD-12 is aimed at.

I should point out that the real timing of the MD-12 is dictated by our airline customers. It's our airline customers that are demanding that we provide this aircraft to them now.

SENATOR BOND. And, I gather, you are in active discussion with at least more than one customer who is already prepared to talk about specifications and other items which you would need to include on the airplane?

MR. WOLF. We are in very active discussions with multiple customers at this stage, doing engineering configuration work with their help.

SENATOR BOND. They seem to think that they're going to need the airplane.

MR. WOLF. They certainly do, Senator.

SENATOR BOND. Thank you, Mr. Chairman.

SENATOR BINGAMAN. Thank you.

Senator Sarbanes, any questions?

SENATOR SARBANES. Thank you very much, Mr. Chairman.

Mr. Wolf, you mentioned that one of the calculations that you had in mind and you repeated it in your statement, it was that this investment would help you in sales in the Asian market, as I understand it.

Is that correct?

MR. WOLF. Yes, sir.

SENATOR SARBANES. Which countries in Asia would be more likely to buy from you because of Taiwan participation, other than perhaps Taiwan itself?

MR. WOLF. The primary issue is that, by establishing a presence in that marketplace, by being able to do business in that region, by being able to understand our customers in that region, we would expect to expand our ultimate competitiveness, our ability to satisfy those customers.

There are customers within Japan, Singapore, Korea and throughout that area that we believe will have a need for this generation of aircraft. We need to get closer to those customers to understand their business and to be able to better provide a product to them.

SENATOR SARBANES. Now, there's a story in the *New York Times* on February 25, out of Singapore, that says at the end of the story, addressing this very point of yours about gaining access to the Asian market—and rivalries in Asia run so deep, especially among Korea, Taiwan, Hong Kong and Singapore—that it is possible that Taiwan's manufacturing role could hurt the company's sales efforts as much as it helps.

What's your response to that?

MR. WOLF. We would disagree strongly with that statement. But, on the other hand, we're not implying that by having an operation within one region that we'll automatically gain business from a customer in another region.

We're not naive enough to think that that's the case. We do expect that, as we're able to understand the needs of that region better, we'll be better able to serve our customers and, therefore, gain a greater percentage of their business.

SENATOR SARBANES. Isn't it more likely that these other countries would also demand local production?

MR. WOLF. At times, there are needs of other countries that are expressed as a consequence of our doing business, and we deal with that as a part of doing business with the airlines.

SENATOR SARBANES. The answer is yes, I take it?

I mean, I take that response, in effect, to be a yes answer to the question. Is that right?

MR. WOLF. Some customers and countries have stronger desires for that than others. Some have no desires and have no strings attached to their business. Others have strong offset agreements implied.

SENATOR SARBANES. Now, I want to address the statement, or the sentence in your statement where you say: The market can certainly support three commercially motivated manufacturers—talking about the international market—the worldwide market—as you project it out for aircraft.

I want to accept the premise of that sentence for the purposes of our discussion. In other words, I accept the premise, in fact, I very much want to accept it, that the market can certainly support three commercially motivated manufacturers.

Now, you underline in that sentence the words "commercially motivated." And I want to know how you get to that state of affairs. I mean, clearly, I assume that one of these manufacturers is Airbus.

Is it in your thinking?

MR. WOLF. The intent of underlining that statement, Senator, as you have so eloquently stated earlier in this hearing, is that, today, we have two commercially motivated suppliers and one that is not commercially-motivated.

SENATOR SARBANES. How do we get to three commercially-motivated manufacturers so that we can be dealing with a market that can support three commercially motivated ones? How did we get there?

My perception, I have to tell you, is that the U.S. companies, I mean, some questions have been raised about your arrangements. You're denying and saying that there's going to be no subsidy and that there's going to be straight commercial.

And let me accept that for the purpose of this discussion. That has not really been my focus at this hearing today, I think, as you will appreciate.

So, let's assume that we have two American companies that are commercially motivated. We're trying to play by market rules. You have one company that's not playing by market rules, clearly. And, as a consequence of not playing by market rules, it's gaining market share, which of course is weakening the position of the two American commercially motivated manufacturers.

Now, what do we do about that?

Some people are saying, well, we just continue to play by the market here and, somehow or other, it's all going to come out all right.

I have great difficulty in perceiving how that's simply going to happen. What is the strategy that will induce, persuade or even compel the one manufacturer who is not commercially motivated to play by the commercially motivated rules?

What's your thinking on that?

MR. WOLF. Senator, we agree completely with you that there is a significant issue here, and we've stated privately and publicly that we simply have to bring the third manufacturer in line. It's absolutely necessary that that be done.

But, at the same time, we have to recognize that it's been a very difficult job. We support our government's thrusts in this area. I would like to ask my colleague to my left to make some comments because he's been involved for years in these discussions.

MR. OLMER. Senator Sarbanes, I don't know if it's a compliment to be associated with these negotiations over many years. But, at least, I know where some of the skeletons have been buried and where the bodies are today.

The example of Airbus negotiations happens to be one where industry has, by and large, with few exceptions at the margins, stuck together throughout so that the positions of Boeing and McDonnell-Douglas have been essentially the same in the last few years.

And the government has, by and large with few exceptions at the margin, accepted those views. The differences have been over such things as the belief in how far the Europeans can be pushed and what could be achieved through the process of negotiations.

Everyone wanted zero subsidies. But it was made plain that the Europeans would not accept that. So, we've accepted, for the purpose of discussions, a basket of conditions. And I admired Mr. Clarkson's response regarding the repayment aspects of these permissible subsidies. They are not subsidies that would be permitted and then forgotten about, but subsidies which would have to be paid within a finite period of years on commercial terms.

And we've been led to believe that's the best we can do. We can't get any more. And to press any more with, say, a tough 301 case, which is, I understand, under consideration and, perhaps, to be initiated by the government itself, might open the companies in the United States to retaliation in European markets and elsewhere.

SENATOR SARBANES. But if the best we can get upon analysis proves inadequate to sustain the American producers who are trying to play by the rules over time, then it's a losing proposition for us. Maybe not in the short run, but certainly over some period of time.

And it calls for a different strategy. Now, it may not be analogous, but in the export-import area—and you're familiar with that as well—we couldn't get the Reagan Administration to compete with the tied aid packages that the European countries in particular were offering in order to gain these contracts.

So, the Congress established a war chest to go in there and fight them tooth and nail. Our position was that you shouldn't provide these subsidies, but if you're going to provide them, then we're going to be in there, in effect, matching you so that you're not going to gain the contracts, particularly in certain key areas, because what they do is, they go in, they gain the initial foothold on a particular technology, say, telecommunications in some developing country, to get the first contract in.

Once they're in there, it's very difficult to ever move that contract away from them. So, they do the loss leader. They gain the business. We're shut out of there. And, thereafter, they can reap a pretty good profit out of that thing.

Now, I'm not fully satisfied with how it's working. But to the credit of John McComber, who is now president of the Export-Import Bank, and I think he is a very tough-minded, practical sort of person who is not caught up in this ideology that floats around, they're matching them in certain instances.

They're saying, well, all right, if you're going to underwrite, we're going to underwrite. You're not going to put our American producers at a competitive disadvantage by the subsidy arrangements that you're giving.

If you can beat them on cost and quality, that's fair game. But you're not going to beat them by coming in and, in effect, doing the financing arrangements and handing out these grants and loans; combined, in order to get the contract.

And he's had some success in that regard, partly in backing them off, since, in effect, they're going to get into a bidding war with a country that has some deep pockets, partly in backing them off. And when they won't back off, by going in there and competing with them.

Now, it seems to me that we have to be prepared to consider moving in that direction in this field. Let me ask McDonnell-Douglas a question.

Is it your view that, if Airbus had not been subsidized, you would be one of the two major producers of airplanes and in an entirely different position as far as your financial and commercial situation now is?

MR. WOLF. There's no question about it, Senator.

SENATOR SARBANES. That's my point.

Thank you, Mr. Chairman.

SENATOR BINGAMAN. Thank you very much.

Thank you, Mr. Wolf and Mr. Olmer, for your testimony.

We have two additional witnesses whom I'd like to call forward at this point, James Beggs and also Daniel Hartley.

Gentlemen, thank you very much for your patience. I know that we've gone on longer than any of us anticipated with the earlier witnesses.

We do very much appreciate your being here. Mr. Beggs is, of course, a former Administrator of NASA, now with J.M. Beggs and Associates. We're anxious to hear your views first, and then Mr. Hartley.

Again, I would just urge, if possible, if you could summarize your statement, I would appreciate it.

STATEMENT OF JAMES M. BEGGS, SENIOR PARTNER, J.M. BEGGS AND ASSOCIATES

MR. BEGGS. Thank you, Mr. Chairman. I will summarize very quickly since a number of the points that I made in my testimony have been covered both in the previous testimony and the question and answer period.

I would emphasize, as you have, the importance of this industry. And I believe that it is exceedingly important. Of course, air transport in this industry and internationally is a vital part of every country's economy. It's vital to every business activity in this country.

There is one point that has not been made. There is a prestige attached to passengers and high-value freight flying on American-built—designed and built—airplanes. As a matter of fact, I have long believed and continue to believe that the fact that the preponderance of air transport is carried on American transport has a halo effect for other high-value and high-tech projects manufactured in America.

The industry is, as has been noted, an exceedingly complex and difficult business. It is an international business. And it is one that

companies, if they're going to be successful, must understand foreign government policies and expectations, and, indeed, the question of offsets and trade reciprocity, if you will, started a long, long time ago.

We started down this long, slippery slope many, many years ago when we started to agree to offset agreements, both for military and commercial aviation.

I will not comment on the business arrangements that are being proposed. They've been discussed. I do not believe that there's any short-term economic or technological impact, certainly not a military technical impact by an arrangement of the type that's being proposed.

However, as you have noted in your questions, Mr. Chairman, there is a long-term impact on the supplier industry and that is inevitable.

In my view, the most important thing we should keep in mind is that this is a high-tech industry. We can't turn back the clock. We are where we are with the competitive posture in the world. The situation with Europe on Airbus has been discussed at great length here.

I would only comment that the best advantage that this country has is in maintaining its technological lead in this area. This still is a developing science—aeronautics—and if we want to prevent more of the industry from going abroad, our only real security is in maintaining our technological lead.

It is I think, therefore, necessary for the Congress and the Administration to address the needs of the industry and the science and technology for the future. And I would cite a number of areas.

We need to do more work in high-speed aeronautics, both in the propulsion and air frame disciplines.

We need to increase expenditures in subsonic aeronautics, to increase efficiency of the current generation. We need to increase our efforts in flight research and validation programs to reduce the risk of application of new technology and to keep ahead.

That requires a close working relationship between NASA, DoD and the FAA. I would urge the Congress to take a close look at the coordinating mechanisms that currently exist between the various agencies involved in aeronautics.

We need to spend more money on the splendid complement of national aeronautical research facilities, most of them operated by NASA, but some by the DoD.

And all of them, if we expect to maintain our lead, need investments in the future to increase their productivity and efficiency.

We need to invest more in advanced manufacturing technologies to sustain America's leadership and productivity.

I might point out there, Mr. Chairman, that most of the money that has gone into manufacturing technology has generally been an investment by the Defense Department. Moreover, that investment has been program-related.

With the decline of the Defense budgets, there has to be an advanced manufacturing technology program in our government broadly supporting

the industry if we expect to maintain leadership in this vital area in productivity.

Finally, and perhaps most importantly, we need to improve the working relationship between the government and industry so that industry input is governing in defining the research and technology effort.

And that probably, in fact, I believe necessarily, will require reassessment of the various conflict of interest statutes enacted in recent years.

Mr. Chairman, I don't think it takes a great deal more money to do the things that I have cited. If we don't do them, we will steadily lose our lead in commercial aviation. If we do do them, I think that, perhaps, we can make it prohibitively expensive for foreign competition to stay up with us.

In conclusion, Mr. Chairman, I'd like to point the Committee to an article that appeared in this Tuesday's New York Times by Bill Broad, the headline of which says: "Japan seen passing U.S. in research by industry."

It also points out in this article that Germany is surpassing us, both countries spending more of their GNP as a percentage than the United States.

I think this is a very serious issue that needs to be addressed by the Congress.

Thank you, Mr. Chairman.

[The prepared statement of Mr. Beggs follows:]

PREPARED STATEMENT OF JAMES M. BEGGS

Mr. Chairman and Members of the Committee:

I appreciate the opportunity to testify in these important hearings. Civil Aviation is a technologically vital and exceedingly economically important sector of our Country. It generates about $100 billion in sales and is one of the bright spots in our balance of trade, generating a positive balance of $30 billion. And, of course, air transport, as the primary passenger and high value freight carrier, is vital to almost every other business activity in our Country.

Participation in this industry involves high risk in a number of areas.

- Huge amounts of capital must be committed several years in advance of sales of a new transport.
- Selling prices must be established well in advance of completion of detailed design and development, which meets market conditions and results in a break even quantity within reasonable expectations.
- The design must be technologically superior which usually entails substantial technological risk.
- The market is international in character which requires an understanding of foreign government policies and expectations, as well as competition with nationally sponsored companies.

I cannot comment specifically on the impending business arrangement between McDonnell-Douglas and Taiwan since I am not familiar with the details of that arrangement, however since the market is international and the Asian rim is increasingly important to the industry, the arrangement probably makes sense from a market view. It is however distressing that this Country seems to be increasingly confronted with the necessity of moving manufacturing jobs abroad in order to preserve its position in the marketplace.

There will be, as well, an impact on the supplier industry, since the logical start of a partnership will be the acquisition of components and parts from abroad. This will necessarily increase the costs of American suppliers due to the reduction in volume. This in the face of a supplier network already impacted by the downturn in Defense expenditures.

In my view, however, we cannot turn back the clock. We can do a better job for the future in helping to reduce the risks in competition. This can be greatly assisted in the time honored way of government investment in research and technology, including manufacturing technology.

The government, through NASA and the DOD, should invest more resources in Aeronautical research and technology. Aeronautics is still a developing science and there are many important research areas yet to be explored The NASA budget for aeronautics R&D is about $565 million in FY 1992. This budget is insufficient to do the necessary flight research work which will bring new technology to practical application with reduced risk. In particular, we should:

- Do more work in high speed aeronautics in the propulsion, airframe and control disciplines.

- Increase expenditures in subsonic aeronautics to increase efficiency of the current generation transports.

- Increase our efforts in flight research and validation programs to reduce the risk of application of new technology. This requires a close working relationship between NASA, the DOD, and the FAA. The coordination activities between these agencies should be reviewed with an eye to improving these relationships.

- Spend more money on the splendid complement of our National Aeronautic Research Facilities to improve their productivity and efficiency.

- Invest more in advanced manufacturing technology to sustain America's leadership in productivity.

- Improve the working relationship between the government and industry so that the industry input is governing in defining the R&T effort. This will probably require a reassessment of the various conflict of interest statutes enacted in recent years.

Mr. Chairman, the additional amounts of money needed to improve all of the above is not significant in the total budget context or even in the NASA budget. The addition of $400 or $500 million to the NASA budget in the coming few years would rectify most of the deficiencies cited. It is a small price to pay for continued leadership in civil aviation.

Mr. Chairman, again I thank you for the opportunity to appear before your committee. I would be pleased to respond to questions.

SENATOR BINGAMAN. Thank you very much.

Many of your points are ones that I've agreed with for a long time. We certainly intend to continue addressing them.

Mr. Hartley, why don't you go ahead and summarize your statement, if you would.

STATEMENT OF DANIEL B. HARTLEY, PRESIDENT, SEATTLE PROFESSIONAL ENGINEERING EMPLOYEES ASSOCIATION (SPEEA)

MR. HARTLEY. I wonder if it would bother you if I take off my coat. Let me tell you why. We talk about technology. We talk about technicians in here. I'm an engineer. Technology is not something you can put in a bottle or write on a piece of paper. The technology is the knowledge that's up here in the heads of we engineers in this country.

I have 29,000 people in the union that I represent. I'm a full time engineer. I work every day as an engineer. I'm the president of the largest group of engineers in the union that there is in the world, the largest concentration.

I hear talk about technology that is really sort of flippant. They say, "Well, we'll take care of technology," this sort of thing. But it doesn't fly with us.

We talk about subsidies to Airbus. You know, my people have fought this battle for 20 years. And my company is making a profit in spite of the several billion dollars a year subsidy.

We have saddled up to the problem that we have here and we're addressing it. And we're hitting it hard. But I'll tell you what's happening here.

We're getting to the point of finding the straw that's going to break the camel's back. I can't carry everything that I have to carry with my people and fight these other issues, too.

We are talking about a new Asian Airbus. We talk about technology transfer. There is no technology transfer in transferring plants. The technology transfer is the personal knowledge that went into these plants—any more so than buying a set of plans means that you're an architect.

I can tell you some of the things that Larry Clarkson was saying, if Boeing tried to get into an arrangement like that to transfer technology, we're the people who know who the technology is. It's us.

It can't go without us. It's no different to us that a Boeing airplane is built somewhere else. We'll be on the streets if we see technology transfer in a deal like this Taiwan deal for Airbus.

Military technology, commercial technology?

The only difference is that the commercial technology is better than the military technology. It's more up to date. It's less fettered by regulations.

If you talk about technology in aerospace, you're talking about the book you're reading, the management book, the rules you follow. You're not talking about any difference in the engineer's head. You're talking

about an engineer here that's been in these Black Hole programs for a number of years, cutting-edge technologies. And I know what the technologies are.

Commercial technologies are tougher, and there is most assuredly a transfer of military technology. And I can probably parade 29,000 engineers before you who will tell you that.

We talked about jobs. If I could talk with you for about 5 minutes here, I think the number of engineers I had—I think there are a million and a quarter in this country—they're essentially supporting 250 million people in this country.

That means, if I talk for 5 minutes—300 seconds—and I fail to impress this in your mind that jobs are slipping away at the rate of 10,000 a second, that's what we're talking about here.

I can't worry about what happens to GATT next week, next month, or the 31st of March.

The work that we do has to be 20 years ahead. I am worried about where these young engineers are going to come from that we need.

I've heard many, many things here today that I would agree with. I heard some things that I definitely disagreed with, too. I disagreed a great deal with several things that John Wolf said. They don't fly so far as an engineer is concerned.

I heard a few statements here and there that I disagreed with. For Senator Sarbanes, when Laura Tyson was testifying, I had written in big capital letters before he mentioned it, I said: An economist that an engineer understands.

Very impressive. What she's saying is right. It's almost as if she's been looking over the shoulder—I don't know where her leak is. But it's almost as if she's been looking over the shoulder of things that we've been running into.

I hear a lot of talk about money. I know how much money and how much time it takes to do one of these airplanes, and I know what we have to do to compete.

We could build an airplane in a hurry not too long ago, but we can't do that any more. It takes a long time. We don't get any support from anybody. Technology, when we talk about these plans on technology, my phone hasn't rung. Nobody calls me and says, hey, we have a technological problem here. Are you guys involved in this?

It might as well be a different world than the one we're living in. So, I want to stress to you that it is a problem of technology. This technology problem has not been addressed.

I don't know if you've had a chance to look at my testimony.

SENATOR BINGAMAN. Yes.

MR. HARTLEY. Did you notice the plan Taiwan has in there? I'll tell you where that came from. That came from what Douglas was telling their employees down in Long Beach. OK. That's different than what I hear here.

Where do we believe? Where do we stop? Where do we continue?

And I'll tell you something else. When I look at their plan, you know something, the Taiwan plan, it's good. It will work.

They say that they're going to start an Airbus industry and they talk about additional airplanes. We've talking about jobs here, 5,000 jobs, 1,500 jobs, that sort of thing.

They're talking back here, if you look on, well, it's 10 or 11 there, or on the middle of 11. They're talking about putting 5,000-7,000 engineers a year into that industry.

And I'll tell you, that's what it's going to take. And it's going to take 20 years to build that industry up. We're not talking about you and me right now. We're talking about our kids and our grandkids. And I don't want to have somebody come back and say that we didn't give it a good fight today.

I'm ready to roll up my sleeves here, get in my engineering outfit, pick up my nerd pack here, and let's get at it. I don't want to hear all this rhetoric here. I want to do something.

I'll tell you something else. My 29,000 people have been out here in a bargaining unit, and I'm freely-elected, as president, by the way—it's not one of the things that you keep your own powers in and all that sort of thing. I'm the guy that, as unsophisticated as I am, they want to go out here and battle for them, for now anyway.

But this group of people here has to worry about the future because no one else is worrying about the future for us. We can squeeze a lot more out of these airplanes.

I don't think that this market has anywhere near been tapped. We're at a slow-down right now, but that's the time for us to move out.

I can tell you something else that really bothers me here. When I look at what Taiwan says that it's going to take, and I agree with that, Douglas doesn't have the horses. They don't have enough people down there to support what they're talking about.

Last night, of course, I called in when I got here. We just had 6,500 people cut yesterday. I'm hearing from people that have been friends for 15-20 years that are looking for a job. Any kind of cut is going to cut deepest at Boeing. And the hurt of the cut is going to be in the future—5, 10, 15 years from now.

The question that we're asking here is not a question of ideology. It's a question of technology. And the answer to this question is—there's going to be one answer that we're going to determine—Are the people that are doing what technology says can be done going to speak English or another language? Is it going to be something else?

I appreciate your time, sir.

[The prepared statement of Mr. Hartley follows:]

PREPARED STATEMENT OF DANIEL B. HARTLEY

My name is Daniel B. (Dan) Hartley. I am an engineer...who has worked in the trenches of engineering for over 35 years. I speak from the viewpoint of the working engineer, one who has also been chosen by my peers for my position as President of the 46-year old Seattle Professional Engineering Employees Association (SPEEA). Although I work full time at Boeing, my views are my own and may or may not agree with any Boeing testimony. I am not trying to sell any particular product to the government. I am not requesting money. I'm not asking for some special favors. To me it seems like everyone who comes here is always saying how to cut the pie. We engineers want to tell how to make the pie bigger.

SPEEA is the bargaining agent, the union, for 29,000 Boeing engineers, primarily in Seattle and the Puget Sound Area, but also in several other (but not all) Boeing locations around the country. We are far and away the largest concentration of engineers in the world, and also one of the largest independent local unions. We are the people who design the Boeing airplanes. Currently about 80% of us work on commercial airplanes, with the remainder working on government programs, space and military mostly. I wrestle with the problems of aerospace engineers daily.

I address my union's opposition to the McDonnell Douglas sale of the Douglas commercial aircraft manufacturing operation to a Taiwanese consortium that will eventually be foreign controlled. The impact on the aerospace industry in our country will be irreversible, given our lack of any positive industrial policy.

The issue is technology transfer that will quickly result in major job loss for many areas in our country.

To allow the sale of Douglas to Taiwan is to encourage export of cutting-edge technology. The ability of America's remaining aerospace companies to sell in the world market will be dramatically reduced.

What are the stakes? Typically, American aerospace exports perhaps 20 to 30 billion yearly. Boeing has been building airplanes for 75 years; Boeing currently has about 60% of the world market for large commercial jet airliners. Boeing is the largest manufacturing exporter in the world, the largest exporter in our country and the second largest exporter in the world.

It is not generally known that Boeing sub-contracts about 60 to 65% of the manufacturing of our airplane, but we're effectively responsible for all of the design. Boeing's 37,000 commercial airplane manufacturing workers represent 35% of the airplane, so our engineering supports perhaps 100,000 direct aerospace manufacturing jobs, the majority actually being outside of Boeing. These 100,000 plus our 20,000 would equate to 360,000 indirect jobs using the economists' 3 to 1 factor, for a total of half-a-million jobs driven by SPEEA's people, alone...and we are just a portion of aerospace. I recollect that Boeing alone, typically has about 4,000 sub-contractors for each of our 4 major airplane types, in about every state. My 5,000 compatriots at Douglas are good engineers and proportionally productive.

To understand my opposition of this proposed wholesale job export, I state the following well known truths lest we don't communicate:

1. To create our accustomed level of wealth we must convert natural resources into useful manufactured products. The know-how to do this is technology.

2. The engineer is the person who knows how to do this, who has this technology. Without competent engineering, designs that are worthwhile to manufacture cannot be created.

3. The heart of America's long-term strength, both economic and military, ultimately resides in the ability of our engineers (yes, yours and mine, ours) to turn this technology into manufactured products.

4. If our country continues to encourage helter-skelter technology export without apparent regard for replacement with new technology, our children and grandchildren will revert to third-world status as hunters and gatherers.

To me and my fellow engineers these realities pose a dilemma:

- Our society doesn't seem to have any cultural or religious taboos to retard the advancement of this technology. We want the materialistic benefits of technology. We say we want the jobs that technology creates.

- Paradoxically, our country seems to be on an almost deliberate course to deny you and me the benefits of our technology. Is this lack of leadership or, possibly, is this the deliberate path of our leadership?

The proposed sale of the Douglas commercial airplane manufacturing and design functions to a consortium financed and partially owned by Taiwan is just the latest milestone in this headlong plunge.

My average engineer is 39 years old and has perhaps 14 or 15 years of engineering experience, with 10 of those years at Boeing. This means we have some new-hires and some with 30 to 40 years of experience. To be competitive in the current global market we need this mix. Few who are not in technology understand that this typical engineer committed to an engineering career perhaps 18 or 20 years ago. The experience of the engineer is far and away the pacing factor in evaluating the disastrous effects of injudicious technology transfer. Aerospace technology is this experience. It is not a factory or accounting procedure, or organization chart or even governmental ideology. If you want to start a competitive aerospace industry it is a lot quicker and a lot less expensive to buy in to an existing technology base than to try to develop one from scratch, ask Airbus. Likewise, loss of this experience base costs our country a lot more than some short term profit and loss exercise or election tally may indicate. This knowledge and skill in the heads of our country's engineers takes a long time to acquire but can be lost in a flash.

Boeing exported 5 different airplane types in 1991. The first flight of these types occurred an average of 20 years ago. Engineering design started 23 years ago, on average, with design of the 707 (the last two have been built and will be delivered shortly) starting 40 years ago. Our largest airplane has some 8 million parts. Commercial airplanes represent our country's highest level of technology because there are so many parts from such a wide range of technologies and because the standards of safety are so demanding. Each type may represent 5 years of design investigation, then 5 years of detailed design, manufacturing and testing, before being approved for passengers. This takes a lot of agonizing and working together and as you know such a massive job is hard to coordinate. Its all

too easy to lose a bit in translation at each step. It is also a heck of a leadership job that few can hack. To break up a team would send commercial costs to the realm of that all too common in many of our governmental programs, we'd be priced out of the world market. Our airplanes are the best example of technology in production. Our next design will be better, and if we can keep our team together the one following that will be better yet.

This problem of teamwork also extends to our sub-contractors. Often, personal relationships of trust and confidence develop that span many years and several companies. (Military programs usually preclude these practices, hence progress is excruciatingly slow and expensive.) These expediencies are necessary to make the American aerospace machine work. There is absolutely no differentiation between the technical nature of military and commercial work. The only difference is how the management structure works, not the way the technology functions.

Our airplanes are expensive...they deserve to be. When I started flying (I'm a 37-year aviator, too), the automobile was safer than the airplane. Automobile safety has improved considerably. I hear that airplane travel is now 1100 times safer than the auto...and, the price of air travel has gone down dramatically all the while. Wages, in general, are among the highest because the skills required are high (of course, we all know our union engineers are underpaid.). Wouldn't you agree that we American aerospace engineers have done a pretty fair job? Technology doesn't cost. It pays! Why else would this new Asian version of Airbus be touted? (The same discipline was demonstrated by our weaponry; performance in the Gulf War said a lot about the quality of our aerospace technology.)

I think it is fair to ask who really owns this technology that McDonnell is trying to sell. Most of our American engineers represent a large public investment in education and experience. Back in the days before technology bashing was in vogue, the G.I. Bill started hundreds of thousands of my fellow engineers on the road to careers in technology. Many others were helped by loan guarantees and other government incentives and society's encouragement. Technology wasn't some dirty word. Early education praised it. The maturity of experience of the many engineers pumped into the economy by WWII and the GI Bill was a major, if not the main ingredient, in our current technology advantage, in the moon landings and other glitsy aerospace accomplishments. But our WWII folks are all but gone and the Korean War bulge is rapidly thinning. You and I should view Douglas and Boeing and every other high-tech company as a national economic asset. After all, you and I paid for it.

The following broad question is being asked: What are the likely consequences of the proposed equity sale of Douglas from the standpoint of our national interest?

I answer this question from my knothole as the working engineer in technology. To understand my answers, one must understand some nuts and bolts fundamentals of aerospace manufacturing. The capital required to put several million parts together is tremendous. Consequently, the industry's manufacturing is spread over a broad base. The "brand name" manufacturers only make a small portion of each airplane. In Boeing's case, for the next generation airplanes, it is about a third. However, we Boeing engineers are responsible for the design of virtually all of it. How can we exist?...sub-contractors. There is no industry that is so dependent on the sub-contractor base. These sub-contractors may be producing for Boeing alone or for Douglas alone, or both. They may be working on a military project or a commercial plane. We may also have several subs building the same part and in some cases we may have several subs building different parts for the same use. For example, we may use different pumps from several manufacturers in a hydraulic system.

These subs (vendors) are often run by the originating entrepreneurs who are quite efficient and innovative. We design such that they can respond to change much more rapidly than large organizations. Even though many subs are run on a financial shoestring that would alarm the high finance community, their work is excellent. Remember, these are the people who create most of the new jobs and handle an untold amount of the shop skill training in America. They're good people and we engineers like 'em. On the selfish side, they also help the Boeings maintain a much more stable work force. I'm not a macroeconomist but I would suspect that the two major reasons that have forced the 3 billion a year subsidy of Airbus are the superiority of our technology and subcontractor base and recognition that our American engineers are 3 billion a year better than their engineers.

The proposed sale will inflict a serious wound on the American aerospace industry in such ways as:

1. **Loss of high value-added jobs in prime manufacturing and particularly at high-tech sub-contractors who craft 2/3rds of the airplane. We must realize**

this base is already being devastated by the head-long plunge in military programs.

2. As American sub-contractors bite the dust it will raise costs for the remaining players. This increase in prices will undoubtedly decrease business.

3. Considerable worsening of balance of payments.

4. Overall decrease in the confidence of investors in the viability of our aerospace industry. It will force a turning to foreign sources for capital for future projects. Again, more technology transfer will follow. Simply stated, it will make inevitable future foreign technology acquisitions cheaper.

5. Forcing Boeing to respond by increasing foreign participation much more...accelerating the American aerospace downfall. If Boeing cut prices, it would insure that neither Boeing nor this Asian equivalent of Airbus will make money. The effect of this will be to force Taiwan to pump in more billions to protect the money already there. It is obvious this will not occur without transfer of ownership of more equity and technology. Boeing would have no money to continue to launch new, highly competitive products. This new "Asian Airbus" should overjoy European Airbus.

6. Perhaps the most important impact (in view of our 100-year policy of a de facto industrial policy ranging from benign neglect, increasingly to moderate antagonism) will be to discourage our more responsible younger people from entering cutting edge technical careers, of which aerospace is the most highly visible. I must have bright new people coming into our profession...(to pay my social security if nothing else).

If I am to believe what McDonnell Douglas and Taiwan Aerospace people are saying, then this sale will result in the loss of about 10,000 high-tech jobs; this translates to 1/4 million new aerospace jobs for Taiwan. I'm only an engineer who has vast experience on a team that has competed successfully despite our self-imposed obstacles. Taiwan's and our trade experts both want the deal. I'm not a trade expert, but it occurs to me that their trade experts have accumulated 70 billion of foreign exchange while ours have lost hundreds of billions...whose experts would you bet on?

The positive:

I cannot speak with any expertise on the positive effects. They appear to center on some ethereal philosophical reasons that don't pass my engineering muster. Several who support the sale have talked to me and sent me material. For the life of me I cannot follow their logic but I have no reason to believe they are not honorable. I just can't put my heart into most of what I read as being positive. Engineers just need stronger arguments that the ones I hear.

It could result in some short term employment for engineers at Douglas.

I read that the supporters of the proposed sale say multinationalizing a corporation promotes peace and prosperity. Somehow America's current aerospace lead is supposed to be economically destabilizing. Maybe this is why so much military technology must be transferred. I have read where multinationals are stabilizing because operations can easily be hidden from governmental interference by any one country. This secrecy promotes business profitability which elevates monetary control above our nationalistic political processes. This is supposed to be good for me, or somebody.

I cannot speak with factual information but the scuttlebutt in the industry is that McDonnell family members hold very high percentages of company stock. If so, a 2 billion reduction in debt should give these folks a fair near term windfall.

There is one indirect positive effect of the proposed sale. If something like this is the straw that broke the camel's back, if it is the act that makes us wake up and force our so-called leadership off their dead behinds, then it would be positive. Unfortunately, our innocents will be forced to bleed because of the job loss...but this is strictly opinion.

Now, lets look at what I have recently been told are the major points of the memorandum of understanding between McDonnell Douglas and Taiwan Aerospace Company (TAC) as told to Douglas employees. I had not seen this before my December written testimony. I suspect it is generally true. The words are theirs; highlighting is mine:

Douglas separates commercial and government segments to form the new company

The new company headquarters will be in Long Beach, California with two primary operations, U. S. and Asian

Taiwan is offered up to 40% ownership in Douglas commercial business for $2 billion

Taiwan is to produce the MD-12 wing and fuselage in a new production facility at Taichung, Taiwan

Next steps

Conduct due diligence and negotiate definitive agreement
Objective-conclude definitive agreement by Jan 31, 1992
Requisite government approvals

McDonnell Douglas states their strategic alliance benefits are:

Financial Strength
- *Cash from MD-80 and MD-11 for US "green field", risk sharing*
- *Make MD-12 Development cash neutral for McDonnell Douglas*
- ***Substantial portion of equity investment available to reduce McDonnell Douglas debt***
- *New company will start debt-free*

Low Cost World Class Production Capability
- *Major structural assemblies*
- *Feeds MD-12 "green field" final assembly facility*
- *Market Presence*

Pacific Rim largest growth market
- *Passenger traffic to double in next 7 years*
- *Will be roughly equal (93%) to U.S. domestic market by 2010 (currently 26%)*

Market penetration
- *38 to 40% of market in which we compete (MD-80/90 and MD-11)*
- *Now participate in 44% of the total commercial market*
- *With MD-12 and 100 passenger airplane Douglas will compete in 75% of total market by end of 1992*

Taiwan Aerospace Corporation Overview

*Private company with **strong government support***
29% government/ 71% private

Previous aerospace experience

Principals in Taiwan have many years of U.S. aerospace experience.

- *Dr.. David Huang- Chairman & CEO, 22 years of U.S. Space program with Rockwell, PhD from MIT*
- *Dr. Denny Ko-President, Engineering degree from Cal Tech & Berkeley*
- *Dr. Sing Chu- Engineering VP, Engineering PhD from MIT; worked at NASA Ames Research Center*

Benefits to ROC

- *Development of commercial aviation industry in Taiwan*
- *Helps to transition Taiwan's labor intensive industrial base to a technology/capital intensive base*
- *Allows Taiwan to leapfrog industry entry barriers*
- *Avoids the 20 years of start-up effort normally required*
- *Instant world-wide name recognition of Douglas*

ISSUES

Technology transfer

Commercial aircraft technology not unique to U.S., i.e., Airbus Fokker and Boeing alliance with Japanese on 777

Military/defense connection

Complete separation of commercial and government. No involvement with government programs

Job Loss

Without strategic alliance, Douglas will remain a niche player in commercial aviation and there would be a steady erosion of jobs at Douglas. This alliance will strengthen McDonnell and enable growth

Douglas Employee concerns

- *Pay and benefits will remain essentially the same*
- *All existing union contracts will be honored*
- *We have the best employees in the industry and want the company to continue to grow and prosper for our customers, employees and stockholders*

Taiwan Aerospace Corporation (TAC) Background

TAC formed as a focal point for Taiwan's efforts in international aerospace activity.. Its basic mission is the furtherance of the development of aeronautics and space industries and relevant parts and components industries with an aim towards stimulating parallel development of associated industries to

effect a full scale upgrade of Taiwan's domestic technology level.

Formation announced in July 1990. Official opening June 1991
Initial funding/capitalization of $400 million
Capital contributors 24% Executive Yuan Develop. Fund
10% China Steel
5% Bank of Communications
4% Finance companies
57% Consortium of 15 manufacturers

Chairman: Dr. David Huang. Background MIT PhD, Rocketdyne Program Manager, Acting President, Chung Shan Institute of Science and Technology (AIDC)

Proposed factory site: 148 acres adjacent to Taichung Harbor, for fabrication sub-assembly work. Initially processes (chem milling, anodizing, heat treat) would be undertaken at AIDC (nearby military aircraft factory).

Basic Taiwan Data Republic of China provided to Douglas
Area 13,900 square miles
Population 20 million
Language Mandarin Chinese (English required in High School and College)
Gross Domestic production (Billion $) Foreign Trade (Billion $)

		Export	Import
1989	135	66.2	52.3
1990	160	67.2	54.7

Defense % of GNP 5%
Defense % of Budget 35.5%
Current foreign reserves 78 billion (greater than Japan)
Current public debt less than 400 million
Labor escalation 10-11% last 5 years, 8-10%/year forecast
Inflation rate has been 4-6% per year and projected to stay same through 1997
GNP growth rate was 5.2% in 1990; projections for balance of this decade is 6% per year
Transportation: Near seaport and major military airport
Workforce:
commerce/service 35%
manufacturing 33%
agriculture/fishing 17%
Unemployment negligible (1.4%), if anything, workforce shortage

3-5% average annual turnover nationally
Union situation-not a significant problem to date

Taiwan National Priority
Taiwan believes it requires a new industry to sustain economic growth which must be based on high value-added industries

A three year search for other alternatives has brought Taiwan to aerospace

Training and Education
116 universities and colleges
total enrollment *535,000*
engineering/science *180,000*
annual graduates *35,000*
13 government sponsored training programs
train 20,000 each year
1990 government passed "Aeronautics and Space Industries Development Program." Plan is to train 5,000 to 7,000 technicians annually

Douglas is telling their customers that the proposed MD-12 will be the newest, highest-tech airplane on the horizon (and my fellow engineers at Douglas can design good planes and have for 71 years). McDonnell executives then say there is no technology transfer. If true, I am hard pressed to see that this "deal" is the straightforward conventional investment as touted by Douglas executives in earlier testimony. What is the message this sends, not only to my very competent fellow aerospace engineers at Douglas but to all of us in American aerospace technology?

Am I concerned because I think the deal would cause more competition? No, it is in my interest to have the strong, healthy American aerospace industry that this deal doesn't promote. I want a competitive Douglas.

I oppose the sale. It is a one-way street. A prompt Congressional injunction on several grounds is in order. Even McDonnell acknowledges, above, that there are governmental skids to grease to approve the deal. I am not a lawyer but it seems that they wouldn't be concerned about this if they didn't think technology transfer were occurring. Likewise, why are they scurrying around lining up political heavyweights if the deal is so pure and obviously straightforward?

I don't have the calm, genteel graces so evident before committees, so I'll tell you what an engineer sees. The problem at McDonnell Douglas is bad management, almost any aerospace engineer will acknowledge that. How are the interests of America going to be served by exporting the technology and the manufacturing base, to compete with American business, while keeping McDonnell Douglas' management so they can sell to the U.S government, their only remaining customer when the commercial business evaporates? This looks to me like a double loss for our side.

This brings me around to the inevitable question that every one seems afraid to ask. Those of us on the firing lines of technology need to have answers if we are to continue to try to compete: **Do we need to investigate developing a positive U. S. industrial policy?**

What does our current policy look like to an engineer?

1. Antiquated anti-trust laws. The whole driver in anti-trust was to prevent monopolies' tendency toward economic blackmail. In the global marketplace we are encouraging it.

2. Tort laws, as they affect technology, stifle innovation and reward non-value-added litigants at the expense of technology. I'd be interested to know how disputes would avoid Taiwanese courts that constantly flaunt U.S. law? Within the month Piper Aircraft and its 1000 jobs, was sold to a foreign group for moving out of the U. S. It wasn't a question of market: they had a 1300-plane backlog. The reason was to get away from U.S. liability laws. These are a thousand jobs that could have been sub-contracting for us.

3. Lack of investment policy reform, Glass-Steagall, etc. We've got to quit rewarding the short-sighted and start encouraging the long-term thinkers. I don't know the best answer to this; I'm an engineer...but this hurts technology.

4. Indifference toward rampant foreign industrial espionage occurring in our targeted technologies. Again, I'm an engineer, not a lawyer. The legal community is quick to tout "justice" in tort defense but can't come up with some fairness here.

5. Inequities in patent, copyright and intellectual property laws. Anyone who has ever been to Taiwan knows this.

6. Regressive environmental laws that seem to cause more of the very pollution they supposedly reduce. They surely now allow the foreigners to sell us back (in the form of products made in their polluting, OSHA-less factories) the pollution we were trying to reduce. There's no way that I will tolerate an employer harming health or safety but we've gotten ridiculous. If my readings are correct, then Taiwan's main interest in the environment is in exporting pollution processing machinery to America. I will concede that our aerospace is considerably cleaner than most of Taiwan's industries.

7. Apathy in NASA. As an engineer it bothers me to see that only perhaps 6% of the NASA budget supports research in aeronautics that supports tens of billions in American sales and hundreds of thousands of American jobs... plus enough taxes to support all their other programs. To add insult to injury the research NASA or that Boeing does in a NASA facility is made available to our foreign competitors under "freedom of information." This may be partly why Douglas hurts now. What kind of a message is this sending to my fellow engineers?

8. FAA's impediments to our aeronautical innovation. To a working aerospace engineer all I see is an FAA that trips all over itself to see that Russian and French airplanes are certified in the U.S. so they can be sold here but is the epitome of slow deliberation when it comes to common sense certification rules that will promote American foreign sales. From my vantage a good many rules that the FAA lays on our manufacturers are not driven by law but are extraneous promotion of political agendas of bureaucracy run amok.

9. Lack of appreciation for research and development. The heavyweights in the government will talk up basic research but get bored when it comes to the bill-paying industrial phase of the development. We research, create, they manufacture.

10. Failure to appreciate the value of education in preparing a skilled, competitive workforce. I'm no education expert but daily I see the lessening skills of our entry-level workers. I just have to have bright young engineers to replace my highly skilled retirees. It may not be apparent but my engineers are often forced into a less competitive design because our designs must be safe and also buildable by an inadequately trained

workforce. There is scant interest up high in opportunity for continuing education to allow updating technical skills of our current workforce. Is it ironic that these Taiwan executives were trained in the U.S. using American taxpayer-subsidized schools and employment while we working, taxpaying engineers are effectively locked out of the education establishment? We engineers are essentially denied post-graduate education. However, 40% of the graduate students in science and technology in our subsidized universities are foreign, mostly on non-reimbursable foreign stipend.

11. Arrogant indifference to the realities of global competition. Arguably, we have about 1 1/4 million engineers and the number is shrinking. We are not going to keep competing with a shrinking in both percentage and actual numbers of working engineers in the economy. That is about one engineer for each 100 jobs. I'm no expert, but it strikes me as strange that I cannot find any working engineers on any of these so-called competitiveness committees and "technology" committees. Do we have bad breath or what?

12. Arcane rules to address labor/management problems as they relate to competition. Let me mention an area where I am a world-class expert. There is a great prejudice against unions in the annals of government (and industry). It is beyond many of these people's comprehension to think that an engineer could be in a union...the deepest of degradations. I see instance after instance where this attitude defeats well-meaning efforts toward effective use of the engineering force we still have.

13. Tax structure that is tilted against technology. Again, I'm not a tax expert but it would seem wise to run some of the tax discussions past us working engineers to see disincentives not obvious to the experts. Even income tax rules hurt us.

14. Our historical tradition of massive military program changes without regard to the technological impact. If you were one of the engineers recently laid-off from one of our military projects, what would you be thinking seeing our government courting engineers in Russia and offering your tax money to provide them alternate employment? I have even seen plans to eliminate many of our career engineers from active military service: my, how shortsighted. We are quick to

> recognize that the engineer is the key to military technology for the other country but not in ours. We worry about their end-run when a dozen good aerospace engineers could make a producible conventional missile much akin to those that we used so effectively in the Gulf War. Nuclear warheads could be produced by half-a-dozen of our disgruntled engineers using modern manufacturing machinery. We better wake up!

In conclusion, everyone...but everyone who has done a recent study says the problem isn't so much in America's design process as in our appreciation of manufacturing technology, the bill-payer of our designers. This deal is a double whammy because it exports our manufacturing base...and exports our design technology, too. In the end, it is an issue of jobs and the economy. How anyone could suggest this deal makes good economic sense for America is beyond me. That people in high places do, is plenty of reason to take the mystery out of why the world is eating our lunch on automobiles, consumer electronics, optics and so many outer products that require attention to the creative input of engineering and other technology.

I accept that one may argue with the individual numbers and percentages and dollar figures I suggest. I solicit difference with my conclusions, an open discussion, the light of day does not worry me. If due deliberations show my generalities do not support a particular conclusion, then I will stand corrected. Feel free to copy, distribute and quote what is written here. Open discussion promotes better understandings. I would be happy to expand on any of these brief replies at your pleasure.

SENATOR BINGAMAN. Thank you very much. I think both of you have heard most of my questions to earlier panels. I won't repeat those questions. I do appreciate your testimony very much. I think that I'm in agreement with all that I've heard.

I agree that our failure to deal with this Airbus subsidy is the reason why you have 6,500 people losing their jobs at Boeing this week. And I do think that long term that issue has to be dealt with.

If you have a comment on that, go ahead.

MR. HARTLEY. Right here is a notice. That's what one of them looks like. I'm dealing with real people. We have numbers. Here are names of people that got laid off. These are the people that I have to deal with and these are people who have invested a lot in this country.

Let me tell you something. This country has invested a lot in me. I didn't pay for my education. I went to school. I didn't get billed. I couldn't afford to go to college, so I went to the military so that I could get a GI bill because I wanted to be an engineer. And there's a lot of other people who did those things.

I think this technology belongs in this country. And I think that the taxpayers have paid for this technology. And I think that I and our other people do have a responsibility to taxpayers.

Now, with the reference to a subsidy, if I were worried about a subsidy, I'd go up and be a person in France in the Legislature, or whatever they call it over there—they'll be getting after your case and saying, look here, you're getting a subsidy for your Airbus people here in your government, and we're not.

So, it's not a level playing field. In other words, our hundred and some odd thousand people that we're supporting right now are paying taxes, and that sort of thing, a whole lot more than any $2 billion here and there.

MR. BEGGS. Mr. Chairman, if I may comment just briefly and add to what has been a long discussion on the Airbus.

Mixed public/private corporations have been a long tradition in Europe. It has just been in recent years that this country has been hurt sufficiently by those kinds of arrangements that they have risen to the attack.

And I'm not sure that it's much of an attack yet. But we have become concerned only recently. But, you know, the Europeans have had mixed public/private with subsidies in computers. I can mention two in the aerospace business—the launch service—the space launch service's business with Ariane Espace, which is very similar to the Airbus and which was a subsidized corporation.

Instead of 30 percent of that market, they have 50 percent of the launch service's business, a business we once dominated completely. We used to have 100 percent of that business.

In the case of earth observation with Spot Image, another mixed public/private corporation, they now have the lion's share of the business in earth observation.

In short, these kinds of things are pervasive in the market, particularly for high-tech products.

Why is that?

Because they know that, by putting investment in this high-tech industry, they gain a significant advantage in the world marketplace.

I think that it's long since due that this country got very excited about these kinds of things. And I'd like to see a broad attack on the whole issue of how we're going to respond to cases where the Europeans and, in some cases, the Pacific Rim countries as well, have stolen the march in the very area that we consider most dear and most important; namely, high-tech products.

SENATOR BINGAMAN. I think your point is well-taken. I agree. This is not an isolated case.

Gentlemen?

Did you have another comment, Mr. Hartley?

MR. HARTLEY. There are several industries that we are addressing in our union right now, and it's not strictly aviation. It's our targeted industries. It's our micro-electronics. It's our biotechnology. We're not addressing that directly, but we are addressing a third one, communications, civil aviation, materials sciences, robotics, computers and embedded software.

Six of these seven targeted industries hit us directly, and if we do the economic multiplying factors, we're talking about 1 million or 2 million jobs here in this country that are riding just on my 29,000 alone.

SENATOR BINGAMAN. I agree with that.

Gentlemen, thank you again very much. I think it's been a useful hearing.

The hearing is concluded.

[Whereupon, at 1:20 p.m., the Subcommittee adjourned, subject to the call of the Chair.]

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